The Builder.

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Mr. Chamberlain on Art.

We have never imagined Mr. Chamberlain's commerce with the Muses to be of a nature to inspire confidences, and if his address to the art students of Birmingham on Friday last contained no disclosures we must not be disappointed, though we may be, perhaps, surprised.

It is interesting to know what a British Cabinet thinks about art. We know what it does in matters concerning the sites for public buildings and in doles to art treasuries, but it seldom reveals its soul save upon the pleasant occasion of an Academy banquet, when any searchings of the spirit are not to be expected of it. Nor did Mr. Chamberlain suffer any on this occasion. He was, as he explained, an optimist. He saw, in the future of the Birmingham Art School, success based upon some commercial principles. He saw in the past, in the Early Victorian era, with its hideous furniture and its terrible textiles, the sacrifice which society, as a whole, had to make in consequence of the improved social condition of the working classes. These desired, as a part of their improvement, the comforts and conveniences enjoyed by the rich; but their means, alas! were insufficient. They had to stop short of the pleasing and beautiful, and the fashion thus set invaded all ranks.

The reason given by Mr. Chamberlain for the intrusion of so much ugliness is not conclusive to us, although we agree as to the period of decline. We would suggest a different cause, if not so fitting a one from the point of view of the home politician. At the same time we would admit that nothing is more difficult and nothing often more misleading than to specify the causes which have led to some radical change in social development. We are accustomed to the spectacle of great periods of art passing through growth to decay. A natural decline, a moment of heart failure comes upon them, and they cease to be. Or a transmigration of soul may take place, and the leader of victorious arms may take the place of the leader of the choragic festival. A change such as this was effected during the Alexandrian period of Greek art. But these greater movements are not parallel instances to the depression in art-production which occurred during the first half of this century, a depression which extended to all trades and callings to which we look to maintain the beauty and interest of life.

Art production was crushed by a hostile force, the rise of commercialism. There is no reason *per se* why art and commercialism should be opposing factors. Furniture of good design and well put together has its market; and the increased cost of design, which Mr. Chamberlain referred to as a luxury, does not actually exist. But tradesmen entered into competition with the successors of Chippendale and Sheraton, who had no knowledge of the business into which they put their money. A business was simply an investment, and the nature of the business mattered not at all so long as it paid interest. The price of a good workman at once became a more important matter than the skill that he possessed, a quality of which his employer was no judge. Style has always originated in the particular trade, and has not been produced in obedience to any popular demand. As Mr. Whistler has remarked, the ancients drank out of masterpieces, because there was nothing else to drink out of. Consequently all traditions of style, under this new method of conducting business, became entirely lost. We are now endeavouring to remedy this state of things, probably along the only road that is open to us, by the establishment of such schools of art as at Birmingham. For a while, however, there must be an enormous amount of wasted effort, until individual designs have come more into line, and show some sort of agreement. Style takes a very great deal of thrashing out, and at present all effort must be tentative and experimental.

The experiments began with the revival of Gothic architecture. Architects like Pugin and Burges designed their own furniture. The mediæval character of their designs did not recommend itself for general adoption, but the long frost was broken up, and their example was followed by others. In our opinion, the designs for the commoner and most useful objects of furniture cannot be too broad and simple. But the newest feeling for form partakes of an affectation of simplicity rather than simplicity itself. The French have a word for this, but we have not. Moreover, there are certain designers who take themselves too seriously, and who endeavour to "express themselves" in a chair or table. We look forward to a time when the peculiarities of the individual will merge themselves in some more composite type. Not that some one and only form shall be universally accepted, but that each centre of manufacture shall stamp itself with a style that shall be recognisable as being peculiar to it. We do not doubt that this will ultimately come about, and that a large centre of design, such as Birmingham has now organised, will prove itself strong enough to make its characteristics felt in all its decorative trades. Potteries have been long recognised in this distinctive manner, though this manner may have become debased.

Mr. Chamberlain was cynical as to the aims of those who pursue the arts towards the ideals which go to make up the art of the future more, perhaps, than they immediately affect the present. Altruism he said, should be viewed with suspicion. The Knights of the Round Table were all very well when seated in their places. He had read, he added, "when he had time for such reading," something of the lives of the great masters of art in classical and mediæval times, and "he had found that those men were exceedingly human in their defects as well as in their virtues, and full of personal ambition, anxious for the praise and the respect of their fellow-men, not disdainful of the patronage of princes, and not indifferent to the material delights which the successful and honourable pursuit of a great profession brought with it." This,

we need not say, is not the whole story of the lives of great artists, and should Mr. Chamberlain's leisure permit his perusal of other memoirs than those of Benvenuto Cellini, he would find, as in the instance of Michelangelo, that altruism was productive of some startling results. That the commercial instinct in art is, up to a point, desirable, if not necessary, we admit, if only upon the assumption that to produce something that cannot and never will find a market is an acknowledgment of failure, due almost certainly to a false or imperfect conception on the part of the artist. Moreover, an art is probably a livelihood. But we may say this, that unless it be that certain aspects of form or colour, or words or tones it may be, give to the artist, writer, or musician a fuller pleasure than anything else can impart, no amount of ambition or commercial instinct can save his work from mediocrity, nor the branch of the arts to which it belongs from being spoiled by its presence.

THE WORKMEN'S COMPENSATION ACT.*

THE present seems a fitting time to review shortly the development of the Workmen's Compensation Act, 1897. It came into legal operation in July, 1898, and has, therefore, been about a year and a half in force. Such a statute, however, could not begin to show its force for some little time, and the decisions upon it in the Court of Appeal may practically be said to be confined to the year 1899. From time to time we have commented on some of these decisions which appeared to affect trades connected with buildings. That these decisions have been unpleasantly numerous cannot be denied, and this fact shows either that the Act has been badly drafted or that Parliament has left its meaning too vague. We lean to this latter view. It was desired to pass through the House of Commons a measure to give compensation to workmen with as little friction as possible. Politically, therefore, the vaguer the Bill was, the better was its chance of meeting with little hostility. Once on the Statute Book, the Government could point to it as a political achievement. It mattered not to them that many hundreds of pounds would annually be spent in litigation, and that it should occupy the time of the Court of Appeal for nearly one day of every week of each of the legal sittings.

That many of these decisions will have given definite meanings to the statutes cannot be doubted, and therefore to some extent, but to some extent only, will litigation be diminished. But there can be no doubt, we think, that the Workmen's Compensation Act affords the most striking instance which is yet known of the filling in, so to say, of blanks in a statute by means of judicial decisions. For that, in effect, is what has happened. The Legislature have presented an outline which has had to be filled in at the cost of masters and workmen.

This can easily be seen by a few instances. The first section says that an employer shall be liable to pay compensation in the case of personal injury to a workman arising out of, and in the course of, his employment. To this may now be added the words "employment shall be taken to cover a case of emergency outside the regular course of work." For this is practically what the decision in Rees *v.* Thomas states. In contravention of the rules of a colliery, a workman was riding down to the office on a loaded truck running on a tramway. A horse drawing it bolted, and in trying to stop it the workman was killed. The Court of Appeal held that "this was a case of emergency, and that when a workman, for the protection of his master's property, took upon himself, in an emergency, to do something outside his general employment, an arbitrator was justified in finding that an accident occurring to him at such time arose out of and in the course of the employment." An act cannot be both inside and outside the course of a workman's employment. Therefore, we are justified in saying that the decision is, so to say, the filling up of a mere outline of law. The decision is a qualification of the words in the Act.

Take, again, the first Sub-Section of Section 7, "This Act shall apply . . . to employment by the undertakers . . . on in or about any building which exceeds 30 ft. in height that is being constructed or repaired by means of a scaffolding or being demolished." Let us see how this portion of the skeleton has been clothed with legal flesh. Thirty feet in height has a straightforward sound, but a moment's reflection will show that difficulty must arise in its definition. In the London Building Act, 1894, the definition of height is "the measurement taken from the level of the footway if any immediately in front of the centre of the face of the building or where there is no such footway from the level of the ground before excavation to the level of the top of the parapet or where there is no parapet to the level of the top of the external wall or in the case of gabled buildings to the base of the gable." But in the Workmen's Compensation Act Parliament has left it to the judges to complete what the Legislature has left undone. So far this duty has not been largely undertaken, but in one case the Court of Appeal rejected the interpretation of the London Building Act and upheld the decision of the County Court Judge, who had taken the measurement of the building to the top of the roof. But when the variety of modern buildings is considered it is obvious that in many cases even this definition will not suffice. Now we have over and over again pointed out the absurdity and injustice of this limit of thirty feet. The shortest and most sensible step would be to repeal it altogether. When we come to look for a definition of the word we find none in the Act, consequently the Law Courts have had gradually to define by a negative or excluding process. Thus it has been decided that a building which is being "strengthened" is not being repaired, nor does painting come within it. Thus, in the case of workmen being injured in two operations connected with buildings, we are now legally informed that they cannot claim compensation. But did the Legislature, we wonder, intend thus to limit the Act? We suspect they did not. But, at any rate, they have handed it over to the Courts of Law to perform an operation which belongs to Parliament, and we see the result. Then, again, comes the word "scaffolding." This has been held not to include a plank tied at one end to a ladder and with the other on a window-sill. Strictly speaking, we have no doubt—speaking by the dictionary—the decision is right. But can anything be more absurd than that if A is working on such a structure he is not entitled to compensation, and that B is, who is busy on four or five planks fastened to upright poles, which is what is usually called a scaffold? Here, again, as might be expected, the Law Courts have defined the Act in a narrow sense, reducing it to a practical absurdity. In another case it was decided that boards resting upon trestles and upon a pole fastened to the beams of a building constituted a scaffolding. In other words, various pieces of what may be called building machinery are presented to the Court and the question asked, Is this or that a scaffolding? Gradually, we suppose, a kind of list will be compiled which, placed in columns, will show what is or is not a scaffold. But this is a most expensive form of definition.

In some few instances the decisions of the Court of Appeal have had a larger range. Thus in regard to the word "about," for by Section 7 the employment must be "on, in, or about" the various works specified. In regard to this it has been laid down that it is a question of fact whether the circumstances make the word applicable. This decision causes every case arising on this word to be judged by itself. For instance, when a cart was standing in a public street loading goods this was considered to show a state of facts to which the word applied.

The result of a review of the litigation which has taken place undoubtedly serves to clear up, to a limited extent, at any rate, the ambiguity which characterises the Act. It also dispels the idea that there has been unreasonable litigation, speaking generally, between employers and employed. Many cases have been necessitated, not by a litigious spirit, but by the difficulty of understanding the application of the Act. Regarded generally, it is clear that this Statute has had very large practical results, and that it appears to be working without causing much derangement of existing business methods. It has placed many workmen in a more assured position, and we hope may tend to steady and sound work; because the more secure and better paid is a workman's employment, the higher is the quality of the work to be expected from him. Whether this is so in England we have some doubt, for the progress in perfection of workmanship does not seem to have kept pace with the improvements in the workman's condition.

* The "Workmen's Liability Act, 1880," and the "Workmen's Compensation Act, 1897." By Alfred Henry Ruegg, Q.C. 4th Edition. London: Butterworth & Co. The "Workmen's Compensation Act, 1897: Being a Digest of Cases Tried in the Court of Appeal." By W. E. Hughes and H. G. Montgomery. London: 1899 (no publisher).

THE ROYAL ACADEMY STUDENTS' DESIGNS.

THE designs sent in by the students for the various prizes offered by the Royal Academy have, as usual, been open to the public for two days subsequent to the prize distribution. We naturally give our first attention to the architectural designs, though these are last in order of hanging.

The subject for the gold medal and travelling studentship in architecture is "A Public School for 200 Boys," for which several designs of considerable merit have been submitted, the studentship having been

awarded for the design by Mr. Horace Charles Hide. It seems at first sight rather odd to find the prize taken by what is certainly, as far as mere drawing goes, the worst set of drawings in the room. But drawing, after all, is not architecture, and a careful examination of the whole of the designs leads us to the conclusion that, on architectural grounds, the prize has been rightly awarded. The plan is, on the whole, and for practical purposes, the best of those submitted; and although the drawings do not set off the design to the best advantage, and their execution in some places is culpably careless, the architectural treatment has more the character proper to a school than that of the only design which on general grounds might claim to take precedence of it. The only thing we object to decidedly in it is the weak and yet coarse treatment of the timber roof of the chapel, with its large cusping, which is decidedly bad. The placing of lavatory doors at the two ends of one of the corridors, in full view along the corridor, is a weak point in the plan, but this is of less consequence in a boys' school than in a public building which is to be used by both sexes. The class-rooms, we observe, face three different ways as to lighting; but as the points are east, west, and north, and not south, no decisive objection can be taken to this, as the class-rooms would be out of use before the western sun could become troublesome in summer.

No. 196 is a beautiful set of drawings, and the plan is more effective architecturally than that of the prize design; the buildings are arranged round a large courtyard surrounded by cloisters, the chapel on the right and the large hall on the left, but not entirely symmetrical. In our opinion the general hall of a school, being the central meeting-place of the whole school, should, both on practical and architectural grounds, occupy a central position. A more important point, however, is that this quadrangle and cloister plan, in spite of its traditional acceptance for school and college buildings, is not the most healthful form of building for a number of persons to be collected in; and in the modern school sanitary considerations take precedence of the picturesque. The architectural treatment is original and not ineffective in itself, but it is not suited, as a matter of expression, to a school, which should have a semi-domestic character. This design conveys more the idea of a prison.

The author of No. 193 has made a clever and effective washed perspective drawing (with a little too much the effect of moonlight), but his plan, with an entrance at the re-entering angle of the school and chapel wing, is not sufficiently simple and centralised—it is that kind of plan, in fact, which may be characterised as "too clever by half;" but the author deserves credit for his perspective view and for a certain originality of architectural detail. In No. 194 the plan has not much to recommend it, and in architectural treatment it is almost as stern and unhomelike as a typical French "Lycée." In No. 197 there is a pleasing and appropriate architectural expression, but the plan is not good. No. 198 is well drawn and clever in points, but eccentric, and also very defective in plan; among other things there are class-rooms so placed as to have the windows at the end instead of in the longer side.

On the whole we may say that the judges, in awarding the travelling studentship, have incidentally given students a useful lesson in the fact that the quality of an architectural design does not depend on the draughtsmanship. We can only recommend the Academy to take the same lesson to heart in making its selection for the architectural room in the annual exhibitions, where for many years past it has been palpably evident that draughtsmanship counts before every other quality in influencing the selection.

The silver medal for a set of architectural drawings, the subject being "Four Bays of the S.E. angle of the Cloisters of Westminster Abbey," has been awarded to Mr. F. W. Newman for an excellent set of drawings; and a second medal to Mr. G. T. Smith. Of the other architectural competitions, Mr. H. Inigo Triggs gains the upper school 25*l.* prize for a very good and characteristic design for an "Entrance to a Public Garden," which has the merit of originality and novelty without being in any way *outré* or deficient in repose. The designs numbered 207 and 208, for the same subject, also have merit. The 10*l.* prize in the lower school was gained by Mr. F. W. Newman for a design for a pavilion overlooking a lake, a severe and restrained design of classic character, and which has a good deal of merit. We have also the very useful but apparently not attractive prize for the best plan, irrespective of design; in this case for "a house in a London street between party walls," which has been awarded to Mr. J. B. Fulton, whose plan is quite decisively the best of the three or four sent in. His scullery in the basement would be rather deficient in light and ventilation, but in general he has treated the difficult problem very satisfactorily.

For the "Perspective Drawing in Outline" open to architectural students only there has been no competition. This is not of so much importance as the fact that there has been no competition for the similar prize open to painters and sculptors only, for which the subject given was "The Staircase leading to the Exhibition Galleries as seen from the Entrance Hall of the Academy." It is in reality much more important that students in painting should enter for a perspective prize than architectural students; the latter, in the present conditions of architectural practice, are certain to learn perspective, while —paradoxical as it may seem—representation in perspective is not really or necessarily any part of their art, while it is necessarily a part of a painter's art, whose business is to represent on a canvas of two dimensions scenes which exist in three dimensions; and it is obvious from their pictures that some painters are very weak in perspective, at all events when they come to deal with the rigid and decisive lines of buildings. We regret also to see that there has been no competition either for "Original Composition in Ornament" or for the "Design for a Medal." This we fear is only too indicative of the atmosphere of the Royal Academy, where painting takes the lion's share in every exhibition, and decorative design is hardly recognised; and when we consider the marked superiority of the medallist's art in France over its standard in this country, where it is with difficulty that we can procure a decent coinage design, we must the more regret that this form of art should be neglected by the Academy students.

The last room contains an exhibition of the work done by the architectural travelling student of 1897, Mr. A. H. Christie; a fine collection of drawings which shows that he has made good use of his opportunities. We may mention particularly the coloured elevation and section of Nôtre Dame du Puy, which, if not quite equal to the same type of drawings turned out by the architects of the French Commission des Monuments Historiques, are not far behind them.

Looking at the other departments of the exhibition, the landscapes sent in for the Creswick prize show for the most part the usual crudeness of colour, but that to which the prize has been awarded, by A. G. Ackermann, is free from this defect, and is a work of great promise. Of the two marked *proxime accessit*, that by Mr. Eden is mainly a clever study of foreground detail, and hardly answers to the subject given—"A Path Through Trees"; that by Miss Gray is a pretty woodland scene, deficient in breadth and force. The Turner medal for landscape has been gained by Mr. F. Appleyard, a young artist of remarkable talent, who has carried off also the silver medal for the painting of a head from the life, the Armitage prize for a design in monochrome for a figure picture, and the prize for decoration of a public building. His Turner prize landscape is unquestionably the best of the set; there is promise also in No. 16, an obvious attempt to produce an effect in the manner of Turner, and in No. 15, in which the treatment of the water is good (the subject is "The Incoming Tide.") For the Armitage prize the second placed work, by Mr. C. G. J. Holiday, might have had a good claim to the first place if the execution had been a little less rough and sketchy; it is the best composition of the set. In historical painting, for which the subject was Ladas, the victor in the Olympian foot-race, falling dead at the moment of receiving the garland, Mr. F. Moss Bennett, who receives the prize, may be said to be first and the rest nowhere; his work is not only the best, but the only one which is not more or less absurd in conception or execution. The drawings of a cartoon of a draped figure (subject—"Justice") are much below the average, and we doubt whether Miss Wear, who gains a *proxime accessit*, ought not really to have had the prize; we do not at all like the drapery in the prize drawing by Mr. F. C. Cowper, and the manner in which "Justice" holds the sword is exceedingly weak; whereas Miss Wear's design, though very simple in treatment, is good as far as it goes. Sculpture is not very strong as far as the ideal subjects are concerned. The gold medal and travelling studentship (subject—"Æneas Leaving Troy") are awarded to Mr. G. W. Bayes for what is certainly the best group among a set most of which are weak in design and somewhat sentimental in conception; the difficulty of making the hero carry Anchises with good grace, and at the same time in a manner mechanically satisfactory, has been fairly met in Mr. Bayes's group; and Æneas, crowned with a helmet of characteristic design, looks more of the warrior than in any other of the groups. The competitors for the 30*l.* prize for a smaller ideal group ("A Greek Soldier Protecting a Wounded Comrade") are much more numerous, but

we do not understand the award of the prize to a group which appears to us thin and unsculpturesque in effect, and inferior to some of the others. The four figures modelled from life by Mr. A. Bertie Pegram, who receives the first prize in this competition, are excellent work.

But the best thing in the whole collection is the design for the decoration of a portion of a public building, by Mr. Appleyard, whose name we have already mentioned, and whose work is the best of this class which has appeared for some years. The subject is "Spring Driving out Winter." In regard to colour, composition and feeling, this is a really fine design, and appears like the work of a mature artist rather than a student. The life-size cartoon figure is also of unusual charm. We are glad to learn that this fine design will be carried out by the artist on the walls of the Royal Academy. There are other designs in the set which have merits either of colour or design, but none which can for a moment compare with the prize design. The future work of its author will be looked for with interest.

NOTES.

The Tunnel Collapse in Paris.

In tunnelling through soft materials it is frequently practicable for excavation to be made without the aid of costly and elaborate apparatus. When, however, a tunnel has to be driven either in mud or other unstable soil, methods such as those adopted in connexion with the Blackwall, Waterloo and City, and similar tunnels are found to be necessary. All works of this kind hitherto carried out in Great Britain have been brought to a successful issue, not without difficulties, perhaps, but certainly without any serious mishaps. This happy experience is no doubt largely owing to the preliminary care exercised by the engineers, and to the intelligence and resourcefulness exhibited during construction both by the engineers and the contractors. Qualifications of a similar nature appear to have been somewhat lacking by those responsible for the excavation of tunnels required in the construction of the Paris Underground Railway. On Saturday evening last a serious collapse took place on the works in the neighbourhood of the Arc de Triomphe, resulting in the formation of an immense circular pit, in which were engulphed trees, lamp-posts, and a large portion of the roadway. None of the workmen suffered, as, in consequence of premonitory symptoms, operations had been suspended earlier in the evening; and happily only two persons were injured. This satisfactory circumstance must be regarded as being particularly remarkable, for the disaster occurred in one of the most frequented thoroughfares of the city. Very fortunately, the district in question is almost entirely free from buildings, or the consequences migh have been disastrous in the extreme. When the idea of the Underground Railway was first broached apprehension was expressed in Paris that the undertaking would constitute a source of danger, and the recent mishap will possibly afford the usual melancholy satisfaction to those who predicted evil. At the same time, we must remark that, given a proper system of excavation and construction, there is no reason whatever why the work should not have been successfully prosecuted, in every sense of the term. It is common knowledge that the mean level of Paris is not more than 8 mètres above the water-line, and as the railway tunnels vary in depth from 10 mètres to 26 mètres, the hydraulic pressure alone is very considerable. Until further particulars are forthcoming, we cannot pronounce a definite opinion as to the cause of failure, but there seems to be *primâ facie* evidence that the immense pressure to be contended against has been very imperfectly realised, and that the general method adopted was one entirely unsuitable under the circumstances.

The British School at Rome.

Professor Aitchison, in a letter to the *Times* on Wednesday, strongly supported, from the point of view of the architect, the proposed establishment of a British School in Rome; pointing out how much we had yet to learn about the great remains of Rome—so vast and important a building as the Baths at Caracalla, for instance, being still unexcavated; and also that the grand style in architecture had greatly suffered, in this country, through our not going through such a course of study of Classic remains as the French students of the Villa Medici go through. There are no doubt those among us, representing what may be called the new school of architects, who will say—"so much the better"; nor can it be denied that the fault in French architectural training is its too academical character; yet we think the balance of truth is on the side of Professor Aitchison. We need not imitate the remains of antiquity, but by the study of them we may acquire a sympathy with great and majestic ideals which is rather wanting in our modern architecture.

The Address to the R.A. Students.

The students at the Royal Academy last Saturday were not called upon to follow any such lengthy and highly elaborated essay on art such as they used to enjoy from Lord Leighton; but Sir E. Poynter's more concentrated remarks were at all events eminently practical, and dealt mainly with a very interesting subject — the line which separates the mere study of a model from the proper use of that study in the production of a work of art. Velasquez, the greatest master of the brush, aimed, he said, only at realising the figure as he saw it; Michelangelo painted the figure as he knew it. "Such knowledge was not merely a knowledge of anatomy, as ignorant people supposed, it was the knowledge that was accumulated by the incessant study of the human form in every conceivable variety of movement." The President went on to point out that up to a certain point the practice of art was easy, as was shown by the immense number of cleverly executed studies which stopped short just where the real difficulty began. This reminds one of Millais's statement, in one of his few public utterances on art, that any one could learn to paint who gave his mind to it; which was certainly rather an exaggeration. But the President's main point (evidently directed against some of the kind of work prevalent at the present day) was, that art meant completion, not studies and sketches. We rather regret that in his opening remarks he should have laid stress on the fact that in the Academy the study of painting occupied the chief place because it was the art which made the most general appeal to our sympathies and tastes. Strictly speaking, this may be true; but the tendency of the public at present is so greatly to exaggerate this view—to the extent of thinking (or acting as if they thought) that art means painting, that it is desirable that the other side of the matter should be forced on their notice, rather than that they should be apparently encouraged in this exclusive attachment to painting.

The Coal Conciliation Board.

The resolution adopted by the Coal Conciliation Board last week, affords a notable testimony to the satisfaction which that body is giving—to its constituents. The satisfaction with which the manufacturer and householder will contemplate the latter part of the resolution may not be wholly unalloyed, though all will be willing to congratulate the board upon its success. It would, under the existing arrangement, have expired on January 1, 1901; but so acceptable has its working proved, both to employers and employed, that it was resolved to give the Board a further lease of life until January 1, 1904. In addition to this, the scale of advances has been made more elastic, though only in an upward direction, the minimum remaining fixed at the 1893 figure. This will doubtless work all right (for the coal trade), so long as the boom in iron and steel continues, and the carrying trade keeps brisk. If at any future time the working of the scheme should appear less satisfactory to those most nearly concerned, they must recollect that they have chosen their Conciliation Board for another term of years "for better for worse."

The Decay of Cement.

One source of trouble confronting water engineers is the more or less rapid disintegration of cement mortar used in the construction of reservoirs. This action, for which no effectual remedy has yet been devised, is supposed to result from the solvent properties of carbonic acid and other bodies contained in the water. Gradually, but surely, the cement is decomposed and detached in a form resembling mud. Recent ingenious inquiries appear to indicate that the mortar, in its reduced state, is densely populated by bacteria of the nitrifying order, and the inference is drawn that the destruction of masonry walls is attributable to these energetic organisms. Only a few days ago, we were told on good authority that some of the trouble experienced in iron water-mains is due to micro-organisms, and if building materials are now to be regarded as the legitimate prey of these tiny foes, a new terror will be added to the daily practice of the architect. Perhaps, however, it is the fashion nowadays to attribute too much to bacteriology, which as a generally inclusive term bids fair to rival "that blessed word Mesopotamia." At the same time, if it be proved that the particular effect in question is really produced by an organism, some counteracting influence must be sought. Inasmuch as nitrifying organisms are to be encouraged in water forming the basis of public supplies, the remedy may be looked for in some "germ-resisting" form of material rather than in the exclusion of purifying bacteria.

Pneumatic Foundation Work.

A New York architect has lately made the foundations for a new building under circumstances presenting some natural difficulties

and requiring most careful treatment. A twelve-story steel cage building had to be constructed between two other buildings, one of eleven and the other of eight stories. The foundations of these two structures extend only 12 ft. below the street level, and rest approximately at high-water mark on a stratum of clay about 8 ft. thick, overlying loose wet sand and boulders. Consequently it is not surprising to learn that the foundations of one building had settled some inches, and that the architect hesitated to create any disturbance of the soil, by pile-driving or otherwise, in the course of forming his new foundations at a lower level. His first solution of the problem involved the construction of extended steel grillages, with long, transverse girders, which were to be carried under the adjacent footings; but eventually he came to the conclusion that it would be better to support the new building upon monolithic piers of concrete, bearing on solid rock, about 54 ft. below the street level. Eighteen such piers had to be made, and, speaking generally, each main column of the building is supported on a separate pier, but those near the party-walls rest on cantilevers, arranged so as to transmit weight to the foundations in a suitable manner. For the purpose of reaching the rock beneath, cylinders about 8 ft. in diameter, and 40 ft. in length, were made and sunk in position, additional lengths being added as found necessary. The shell of each cylinder was built of timber, suitably strengthened by angle iron rings, and provided with a cutting edge whose plane inclined slightly to the horizontal. About 7 ft. above the cutter a steel dome formed the lower part into a caisson, from which a steel air-shaft rose to an air-lock. Practically, therefore, each cylinder was a water-tight coffer dam, having an air-tight caisson at its lower extremity. Inclination of the cutting edge was made so that the escape of air might be caused to take place in any desired direction by setting the cylinder accordingly. So admirably was this object achieved that, although some of the caissons were employed within 3 in. or 4 in. from the wall of the adjacent eleven-story building, no disturbance of the soil was observed. Very loose wet sand was penetrated at different depths, so that at times the maintenance of pressure became a matter of difficulty; excavated material was frequently mixed with water, and air bubbled up around the caissons during sinking, though fortunately without causing damage. In good soil, progress was made at the rate of 1 ft. an hour, but entrance upon a bed of boulders, above the rock surface, occasioned considerable delay, and necessitated the use of dynamite for blasting purposes. When the rock was ultimately reached, and had been levelled, the caissons were filled with concrete, pressure being released after the elapse of an interval sufficient to allow the material to set. The dome, air-shaft, and lock of each cylinder were then removed, and concrete was run in. The piers so formed were levelled off and finished by granite caps. No new principles are involved in the work described, but it is worthy of notice as illustrating the fertility of resource frequently exhibited by American architects when confronted by problems which cannot conveniently be solved by ordinary methods. We may add that the whole of the work in question was satisfactorily completed within five weeks after signature of the contract.

Steam Raising and Cheap Fuels.

THE papers on "The Cost of Steam Raising" and on the "Influence of Cheap Fuels on the Cost of Electrical Energy," by Messrs. Holliday and Crompton, gave rise to an interesting discussion last week at the Institution of Electrical Engineers. Mr. Holliday's paper gave many data which will be a help to the central station engineer in deciding what quality of fuel it is most economical to use. For a given sum of money you get more heat from cheap fuels, but they need larger boiler plant, greater storage-room, and are more expensive in clinker and ash. Mr. Crompton's paper seems to us to be a very valuable one. From figures obtained from a year's working of the plant at his Chelmsford Works, where coal costs 17s. 5d. per ton, he showed that the cost of the fuel was only about a halfpenny per horse-power hour delivered at the tools. If the station had been nearer the pit mouth, where coal could be had at five shillings a ton, the cost would be reduced in proportion. Hence in many cases a total cost price of one farthing per Board of Trade unit could be reached, and therefore there seems to be a great future for the investment of capital in power distribution works. Incidentally he praised the new revolving grate made by the Babcock & Wilcox Company. He considered that it performed the duties of feeding the fuel on to the front of the grate and getting rid of the clinker and ashes at the back, without admitting the air, most satisfactorily. Professor Perry showed how the relative advantages of good quality and inferior fuels depended on the "load-factor." On an irregular load dear coal was the more economical, whilst on a steady load cheap coal seemed the preferable. Another point referred to by various speakers was that coal deteriorates in calorific value on keeping. It was mentioned that Welsh fuel stored for one month lost twenty-five per cent. of its value, and in two months and a-half, thirty-three per cent. Seaborne coal also was not so good as the same quality coal conveyed by land.

St. George's Tower, Liverpool.

WE much regret to hear that the Liverpool Town Council have, after all, voted the destruction of St. George's Tower and spire by a majority of 58 votes to 43. It was hoped that the tower was saved, but the counsels of stupidity appear to have prevailed. The detriment to the architectural appearance of the neighbourhood may be compared to that which would be caused in London by pulling down St. Mary-le-Strand, except that the case is stronger for the Liverpool erection, because it occupies a more central position, it is in the way of no traffic, and, as Sir William Forwood mentioned, it marks the site of the ancient castle of Liverpool. It is to be pulled down for purely commercial reasons; "the site was valuable," as one councillor frankly stated. Among those, besides Sir W. Forwood, who defended its retention in the discussion were Alderman Radcliffe—who moved that the question be postponed, Alderman Paul, Mr. Willink (the architect, and recent President of the Liverpool Architectural Society), Mr. Lister, and Alderman Grindley, whose names should be recorded as having done their best to prevent a fine erection being destroyed.

The Society of Fine Arts.

AT the Society of Fine Arts there is a "Child's Exhibition," a good idea for the season, though the contents hardly belong for the most part to art in a serious sense. Mr. J. Hassall's flatly-executed pictures, in a conventional style, of children's sports for the various months of the year, have a good deal of character; and his larger work in the same style, "Blind Man's Buff," shows a crowd of figures very cleverly drawn and grouped, and with a good effect of colour. Mr. Newton Shephard's watercolour drawings belong to a different order; "The Moon Fairy" is a poetic conception, and the girl figure called "The Romp" is a very successful reproduction of eigtheenth century art. A numerous set of very small drawings by Mdlle. Rasponi, illustrations to "Mother Duck's Children," are perfectly charming; the artist has surpassed Miss Kate Greenaway in her own line. Some pencil studies of Dutch children by Mr. Phil May are ugly but artistically interesting. An adjoining room contains a large collection of Mr. Raven Hill's admirable drawings for *Punch*, examples alike of genuine humour and of masterly execution in line drawing.

Mr. Spence's "Behold the Man."

MR. T. R. SPENCE, as some of our readers are aware, commenced practice as an architect, though he has for some time given himself more and more to painting. Mr. Maclean's gallery contains what we suppose may be taken to be his most important work of this class, a picture of Pilate leading out Christ to the crowd of people assembled in the courtyard of the barracks of Antonia, at the north side of the temple area. Mr. Spence has naturally given special attention to the architectural surroundings, but we do not think, in spite of the claim that Jerusalem owed more to Greek than to Roman architecture, that there could have been anything there like the range of Greek columns in front of the judgment hall from which Pilate issues; and the reference to the Golden Gate as the authority for the segmental arcade on the wall in the rear is somewhat absurd, considering that the Golden Gate was probably about five centuries later than the date of the crucifixion. For the picture generally, it is well grouped and painted in the conventional "Bible-picture" manner of which the late Mr. Long was so popular an exponent; those who admired his works will probably admire this.

The New Fountain, Finsbury-square.

THE fountain "inaugurated" (as the French say) in Finsbury-square a few days ago is, unfortunately, another example of the manner in which these things are mismanaged in England. The donors of the fountain (which is a memorial), instead of going to an artist to make them a design, put it into the hands of a firm of marble masons, with the natural well-known result that the work, though well executed in a material sense, is a piece of architectural commonplace, of no value whatever from the artistic point of view. We had hoped that the erection, some years ago, of the Shaftesbury Fountain from the design of one of the first sculptors of the day might have given a turn for the better in the

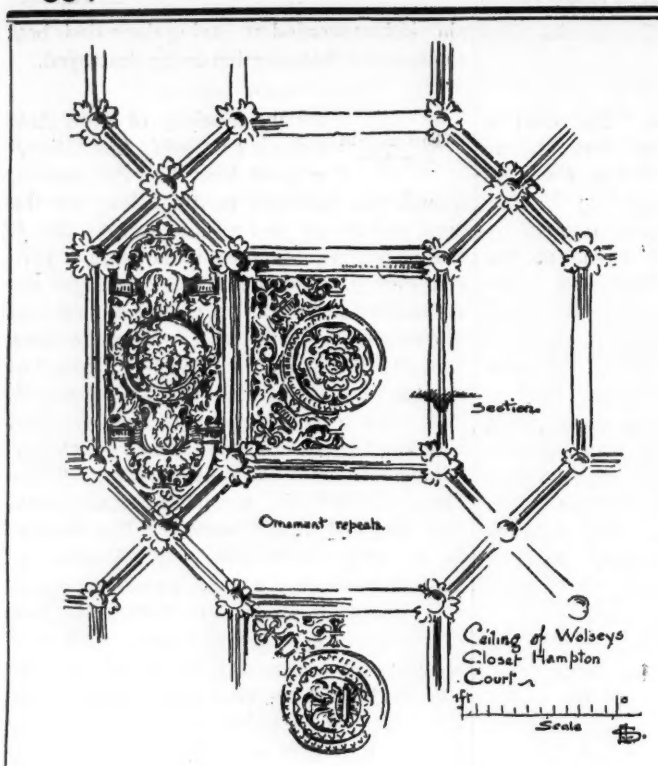


Fig. 1.

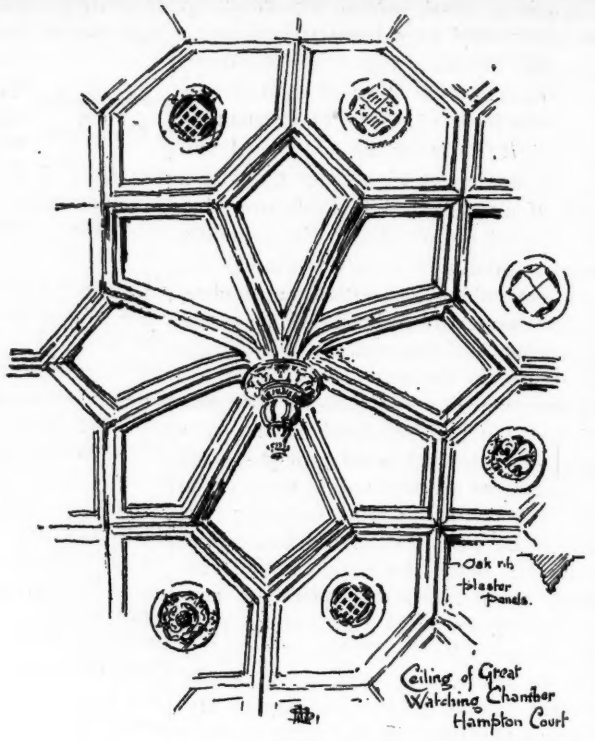


Fig. 2.

management of these matters in London; but the majority of persons concerned in erecting monuments of this kind seem still to think that they can get a work of art without employing an artist—or rather, perhaps, they do not care whether it is a work of art at all, so long as it costs money and makes a show.

CEILINGS.*

In dealing with his subject, the author explained that the early date which had been fixed for the reading of his paper had made it necessary for him to make use of such illustrations as were available, although in some instances they were not the most suitable examples for his purpose. He was fortunate in being able to exhibit and refer to several fine illustrations of the later Renaissance period from Messrs. Belcher & McCartney's book. He reviewed the progress of the plaster ceiling from the time of the introduction of the Italians by Henry VIII., and referred to the ceiling of Bishop West's in Ely Cathedral, a photograph of which is given in Mr. Reginald Blomfield's book on the English Renaissance (this is quite Italian in style, although in plan not far removed from British examples); also to the ceiling of Wolsey's closet at Hampton Court.

The latter (fig. 1) is composed of interlacing octagons formed by wood ribs, with small balls and cut leaves at the intersections, the spaces being filled with cinque cento ornaments said to be of lead, and gilt on a blue ground. The whole is to a small scale, and on two sides of the room there is a frieze cut up into long and short panels, with ornament of similar character, and a wood mould beneath it with Latin motto in gold letters on a blue ground. The effect of frieze and ceiling above walls. entirely panelled with oak, is very satisfactory, In the Great Watching Chamber next to the Great Hall, built by Henry VIII., the ceiling (fig. 2) is constructed of oak ribs deeply moulded, forming a star pattern, with oak pendants and panels of plaster, with shields and badges in circular wreaths of Renaissance character. Although plaster was freely used during the Gothic period for plain surfaces, or in combination with wood ribs, as in the last named example, he did not know of any ornamental plaster ceiling of entirely Gothic character. The late Mr. G. T. Robinson, in his introduction to Mr. Millar's book on plaster work, says that a Guild of Plasterers was founded by Henry VII. in 1501, and that Luca and Bartholomew Penni, Italian plasterers, were brought to this country by Henry VIII. to work at his palace of Nonsuch; and this introduction of foreigners appears to have given an impetus to the craft. This fan type of ceiling, probably suggested by the late Gothic fan vaulting, an example of which was close at hand in the Great Hall, became very general, being found as far north as Sizergh Castle, and a variation of it at Levens Hall, the oak rib being superseded by one of plaster. The date given in Mr. Law's book on Hampton Court of the building of the great Watching Chamber is 1536.

We get another type of plaster ceiling (fig. 3) in the example from an old building, in a dilapidated state, at the back of St. Aldate's, Oxford, which is divided into four equal compartments by cross beams cased with plaster mouldings, the soffits of beams having a very flat ornamented waving band C, running each way from a terminal in the centre. The compartments are cut up by moulded ribs 2½ in. wide, and ornamented with flowers in the spaces. In the upper chamber of this building the roof truss, which in the ordinary way shows beneath the flat and pitched part of the ceiling, is cased with plaster mouldings and ornament.

At Burford Priory, also in Oxfordshire (fig. 4), we again have the fan shape with pendants, but the rib has become wider, 6½ in., and has a running vine ornament between the bends. The pattern repeats all over a large room with fearful regularity, and the cornice is a rude attempt to adopt the imported style. This ceiling is much later than the style would lead us to expect, the date being about 1635, and consequently later than succeeding examples of this period referred to.

In the ceiling from the Reindeer Inn, at Banbury, we find a further development; the planning of the ribs is more complex, and the ornament on both ribs and spaces is better modelled and in the foreign manner. In this room the wainscotting goes right up to ceiling, and the cornice is of wood.

During the time of Elizabeth and James I. ceilings were much influenced by Dutch and German ornament in strapwork and shields. Examples may be seen from Audley End (see lithographs in this issue), Blickling Hall, and Barnstaple, the last-named place being rich in plasterwork, and giving the impression that it was an important centre of the craft at that time. In the fish ceiling at Audley End we see the pendants exaggerated to quite an alarming extent, and the details are of a very mixed character. Elizabethan ceilings are given in Mr. Gotch's book from Broughton Castle, Canons Ashby, Chastleton, Charlton House, Haddon Hall, Knole, and other places, showing that a British style had developed peculiar to this country. In the examples referred to it will be noticed how much better effect is produced by bringing the plaster work down the walls in the form of cornice and frieze, as in the examples from Charlton and Audley End, rather than starting it horizontally from the ceiling. This work when closely examined is found to be very rough in execution, and even allowing for successive coats of whitewash appears to have been so when executed. To attempt to copy this rudeness now is mere affectation; but by studying the old work much may be learnt as to variation of surface and the way in which the ornament dies into the ground, tending to produce that softness of effect, which is so pleasing in the work of this period. The repeating network all over the ceiling has a rhythmic value and assists production when cast from a mould, and variety can be procured by changing the ornament of centres and joining pieces.

There is no reason why ceilings should not be executed in the same way now except the divorce between designer and executant; still a modeller and a plasterer working together could carry out a ceiling, such as the upper photo from Audley End, where there is little repeat, better *in situ* than by any other means. Portland cement and sand are being used for this purpose now, but for the modelled work, only sufficient must be put up to finish the same day, with obvious inconvenience. The method of doing the whole with fibrous plaster is found more convenient, as the work need not be done at the building. The plan is to make a model of any section of the work, the ornament being generally modelled in clay on a plaster ground when a mould is made from it, and as many casts as required are taken from it of fibrous plaster. These parts are then screwed up to battens or joists and the joints made good. The advantages of being able to complete your ceiling, except the fixing, away from the building in alterations or buildings done against time are very great. Another advantage is that so much less moisture is introduced into the building, and the painters' work can proceed at once.

The ceiling over the staircase at Burford Priory shows a great change both in design and execution. The design embraces the whole space in one composition, the ornament is undercut, and the mouldings are of more correct Renaissance sections, with shells and acanthus leaf introduced as enrichments to the cornice. Probably the design was in this case supplied by an architect, and in the earlier examples the craftsman was both designer and executant.

In the church dedicated to St. Charles the Martyr, Tunbridge Wells, there is a singular ceiling, dated 1690, composed of square panels, octagon coffers, and saucer-shaped domes in groups on an otherwise flat ceiling, and at Burwash, in the same district, is another dated 1699, having much the same character in its ornament and showing a considerable acquaintance with natural forms and an endeavour to represent them literally.

* Resumé of a Paper read before the Liverpool Architectural Society on the 4th inst., by Mr. L. A. Shuffrey.

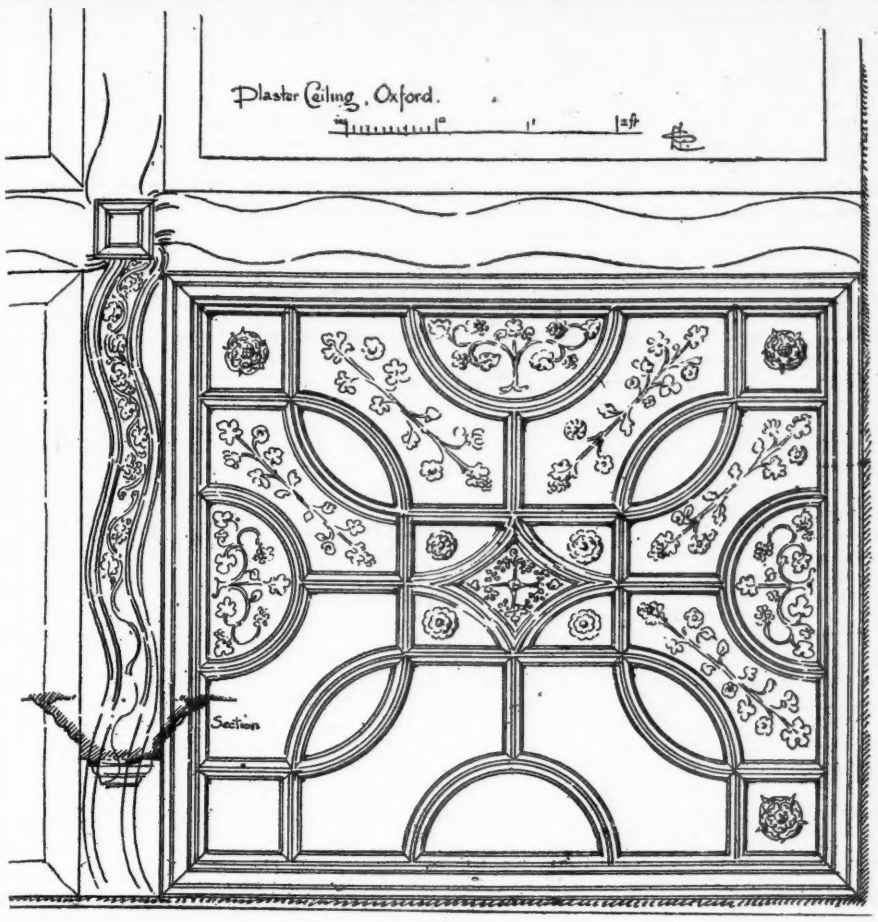


Fig 3.

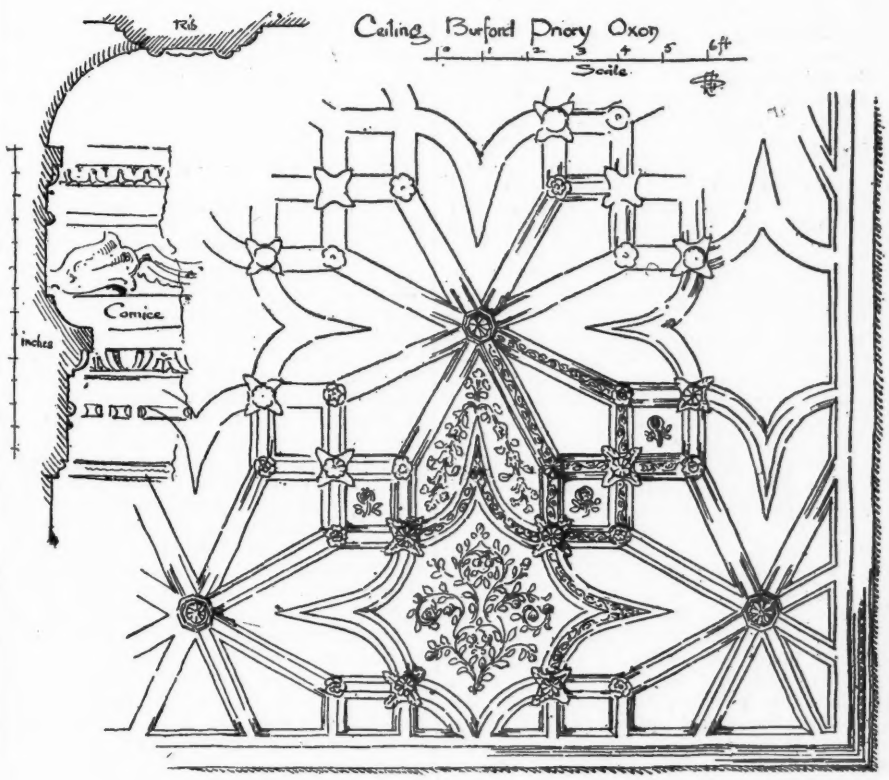


Fig. 4.

Of an earlier date than the two last mentioned we get a group of ceilings designed by Inigo Jones and his followers (see examples in Messrs. Belcher & Macartney's work). The staircase ceiling at Ashburnham House, Westminster, and that of the saloon at Coleshill, both by Inigo Jones, are of the same general design, which consists of a large central ellipse bounded by a heavy band of fruit and flowers lying on but overlapping at the sides the main rectangular compartment. The example from Coleshill appears too large in scale for the room, and the cartouches and swags in the frieze are quite unsuitable for plaster work. The ceiling at Thorpe Hall, designed by John Webb, a pupil of Inigo Jones, is a fine example of broad handling with bold yet restrained ornamentation and within the legitimate possibilites of plaster work.

The further development of this class of ceiling can be seen in illustrations from Belton House, Melton Constable, Eltham, and Groombridge. The heavy band of fruit and flowers appears to have been a favourite feature at this time, some of them showing no great skill in design, giving the effect of a series of lumps, but at Melton Constable the flowers are tied in with a broad running leaf, with very great improvement in appearance. At Groombridge no attempt has been made to restrain the foliage, which sprawls over the ground and disfigures what would otherwise be a good ceiling. In comparing these ceilings it is well to note the various ways in which they leave the walls. Where the cornice of rooms forms part of the wall panelling, as at Thorpe and Groombridge, the effect is not so good as where the ceiling is brought down the walls with a plaster cornice or cove, as at Melton Constable and Belton. In reference to the profuse ornamentation of some of these ceilings it must be remembered that the plasterers were working by the side of Grinling Gibbons or his school, and were not unnaturally led away from the paths of virtue by what they saw around them.

As it is our custom to keep ceilings light in colour, it is desirable when designing cornice, or cornice, frieze, and architrave, to have a clear intention as to where the light colour shall stop, when the walls have to be much darker in tone. The entablature mouldings should always be treated as one group, and preferably of not too great a contrast with the ceiling. During Wren's time, and for some years later, plaster ceilings were very much influenced by French design, and in examining his work in the City churches one feels that his skill was exercised rather in the forms of the ceilings than in their ornamentation. At Hampton Court the ceilings are singularly neglected, many of them having the ineffective treatment of a cove without ribs springing from the four sides of the room. These may have been intended for painted decoration.

The vestry ceiling of St. Lawrence, Jewry, bristles with ornament, and in the Church of St. Clement Danes the treatment of the plaster ornament on walls and arches is very much overdone; and at St. Mildred, Bread-street, while appreciating the skilful and artistic way in which the church has been ceiled, one wishes that Wren had been better served with his plaster ornamentation.

As time went on, with some exceptions, the French influence became more marked; ceilings lost their architectural character and became a field of meandering scrolls without any leading lines to hold them together. As an exception, the ceiling of the library at Chesterfield House, designed by Isaac Ware in 1749, has some good beams, ornamented on the under side with a guilloche, running in level with the corona of a good medallion cornice—all very correct, but the ground is smothered with fluttering ornament in the French style. About the middle of the last century we meet with the Brothers Adam, who introduced a new style and a new process. The style was founded on the Græco-Roman, and the process was the use of composition for the ornamental portions instead of plaster. This being pressed into hard wood or metal moulds whilst hot was capable of producing the very thin ornament which we know as the Adam style, and was applied to woodwork as well as ceilings. In Adam work the dividing up of the ceiling was generally satisfactory, and the ornament not often overdone, plenty of plain ground showing; they also showed originality in the form of their ceilings, being very partial to the segmental arched form and a desire to get away from the flat ceiling, which we might very well copy. The style may be suitably used for low and small rooms. The publication of the antiquities of Greece by Stuart and Revett was followed by ponderous beams and coffers, and highly-relieved pateræ, and in less important work by Greek cornices with refined egg and dart and honeysuckle ornaments, bringing us well into this century, and leaving us the plaster work of the speculative builder as our only evidence of tradition. We have hacked down the work of the speculative builder, and in its place are content with an architectural void, a blank area.

Having taken this rough survey of ceilings from the time of Henry VIII., it would be well to consider how we can profit by this wealth of work left us by our forefathers. In many cases expense prevents the use of ornamental ceilings, but surely there is some way of giving expression to the ceiling without elaboration. Remember that ceilings have to be viewed foreshortened, and ornament should be simple on that account, and, as the light strikes them very horizontally, slight relief will tell. Undercutting is not necessary, and rather takes away from the solidity of the work. As the ceiling can only be examined by the spectator bending his neck, elaborate subjects, or what may be termed high art, are out of place. The general contour of a ceiling should be arched, and this can be done by keeping the cornice as low down as the height of windows will permit, and rising with ascending mouldings or a cove to the highest plane in the centre. A coved ceiling is ineffective mitred four ways, unless ribs are introduced to show

its form, but running the barrel-shape through at each end has a good appearance, and gives a good place in the end spandrels for ornament. Groining the ceilings of passages and lobbies is most effective, as seen in some of the town houses of the last century. If figures are introduced their heads should point to the centre of the ceiling. It frequently happens that small rooms have to be made unduly high for floors above to range with those of larger rooms; this is a good opportunity for keeping the cornice of the room low, and giving the remainder of the space to the ceiling, and the proportion of the room is much improved thereby. Whilst not wishing to see all ceilings elaborated, we should look to it that they are ornamental, in that they complete the architectural expression of rooms of which they become the crowning feature.

THE SURVEYORS' INSTITUTION:

PARTY WALLS UNDER THE LONDON BUILDING ACT.

An ordinary fortnightly meeting of this Institution was held on Monday evening at Great George-street, Westminster, the President, Mr. T. M. Rickman, occupying the chair.

The minutes of the last meeting having been read and confirmed, and some donations to the library having been made, the discussion was resumed on Mr. P. E. Pilditch's paper on "Party Walls under the London Building Act." The greater part of the paper was given in our issue of the 2nd inst.

Mr. Thomas Blashill said he was not surprised at the strictures passed on the London Building Act by Sir John Bridge. The fact was the Building Act of 1894 suffered by overnursing. At that time there was a very good-natured Building Act Committee on the London County Council, and they appeared to think that if they let everybody interested in the matter know what they proposed before they got into Committee in the House of Commons there would be no opposition when they got there. They put their proposals before nine or ten interested bodies, including that Institution, and those bodies immediately set to work with the greatest enthusiasm, and worked with the Building Act Committee in preparing the Act. When the Bill reached the committee-room in the House of Commons, every one of those bodies appeared by solicitor against the Bill, the end being that very few people obtained a grasp of the whole Bill. He thought that very few surveyors had sufficient reverence for that thing of legislation called a party wall. One heard people talking from time to time of "their half" of a party wall and the adjoining owner's "half" of a party wall, but there was no such thing as two halves to a party wall. A well-known surveyor once gave a very apt illustration on that point, as follows:—Two showmen were partners in an elephant, and, dissolving partnership, they asked how they should divide. One said he would shoot his half, but the other said, "You cannot do that, for you have not got a half; we are partners in the whole of it." It was important to remember that a party wall was a thing in which two people were partners, and they should behave towards each other as partners and not antagonistically one to the other. It was not like a light and air case; and so desirable had the Legislature thought this that they had decided from time to time that points of dispute were to be settled by the surveyor so as not to make any more legal questions and struggles over the matter than were absolutely necessary. As to giving party-wall notices, he was afraid that many of them must confess to having in times past followed a very common practice of putting into the notice all that the Act enabled them to do without giving the adjoining owner any notion of what they wanted done. He had seen the whole party-wall clause quoted and served on the adjoining owner, who had to find out the best way he could what was intended to be done. It was legally decided now, and it ought to be fully understood, that the building owner should from the first tell the adjoining owner precisely what he intended to do; in writing, of course, and accompanied by drawings. That was very much better, for it was at once seen whether there was anything to fight about, and if there were not, the matter would be quickly settled without the aid of the third surveyor—who, however, ought to be appointed—and who, in fact, must be appointed before the two surveyors originally selected began their negotiations, for the award must be made, not by two surveyors only, but by two out of three. He was afraid he could not agree in thinking with Mr. Pilditch that the third surveyor did and ought to act as an umpire. It was better that the third surveyor should discuss the matter with the other two and should agree with at least one of them or that they should get him to agree with them, so that the award might be taken up and acted upon. He (the speaker) was once concerned in an important case where the parties on both sides happened to be trustees, and the trusts would expire long before the party wall question would be finally dealt with. It was thought best that the third surveyor should be called in, and the two surveyors having made up their minds what they thought ought to be done, presented an award to the third surveyor for his concurrence; but before the third surveyor agreed, he went into the matter thoroughly, as though it had never been gone into before. It very often happened that an adjoining owner put up a building, it might be a very small one, against an external wall of his neighbour, and, in doing so, endeavoured to give the wall against which he was building the character of a party wall. He should like to know from Mr. Pilditch if that could be successfully done; it very often was done. Was that wall to be treated, when the time came, as a party-wall? He (the speaker) ventured to suggest that it should not, though he did that for the sake of argument. The builder in question omitted to do what the law required him to do, namely, to enclose his building with an external wall, and he had abutted his building against the adjoining owner's wall. Could that wall separate the two buildings? He (the speaker) ventured to suggest that it could not. There was another point: an owner who pulled down his house left the party-wall between himself and his neighbour standing; he had no intention whatever of rebuilding, and all that he need do was to shore against the party-wall and generally protect his neighbour. Was it necessary for him in that case to give a party-wall notice? Many of the difficulties about party-walls arose from the fact of the over-anxiety of the framers of the Act to settle by law every question they could. If they had said less and left more to the surveyors it would have been a great deal better. There were very few party-wall cases that could not be settled by the two surveyors, with the help of the third. Mr. Blashill concluded by referring to some specimens of actual party-wall notices which he had brought down for the inspection of the younger members.

Mr. William Woodward said one important point raised by Mr. Pilditch was as to the service of the party-wall notice. It was the custom to serve one notice, until the case of Findlay *v.* Wood, in which the Master of the Rolls decided that any occupier, or lessee, or owner of a building who had an interest in that building above an annual tenancy should receive a party-wall notice. That involved very considerable trouble in ascertaining the respective owners, and in serving each with a notice. Mr. Pilditch had raised the very important question whether the Act of 1894 annulled that decision of the Master of the Rolls, and whether it was now necessary only to serve one party-wall notice, and that upon the owner of the adjoining premises. He (the speaker) had counsel's opinion on the question, and that opinion was to the effect that under the Act of 1894 it was necessary to serve only one notice, and that the service of that notice was sufficient if sent by registered letter or attached to the doorway of the premises. As to the information which should be given to the adjoining owner in a party-wall notice, he quite agreed that such a notice should be accompanied by a block plan and section showing what was intended to be done to the wall; but the difficulty was that unless they put into that notice more than they required to be done, they might find it necessary to do some work which had not been specifically mentioned and might find themselves pulled up by some opposing surveyor or architect; consequently, a good many surveyors now omitted all they possibly could in their notices. He believed, however, that if architects and surveyors would deal with each other fairly and specify what they intended to do, and accompanied that specification by drawings, and left the matter more to the fairness of their opponent, that would meet Mr. Pilditch's observations. Mr. Pilditch had defined a party-wall very clearly, but he had omitted any reference to the following matter:—If a man built a wall and carried it up to a greater height than was necessary to separate the two buildings, the portion of the wall which was carried up became an external wall, in which a man had a right to place windows. Moreover, it became an external wall with all the rights appertaining to such a wall. If there were one part of the Act more indefinite than another, it was in reference to "owner." Looking at the matter in a common-sense point of view and supposing there were the ground landlord, the lessor, the lessee, and a tenant with, perhaps, an occupation of three years, if the demolition of a party-wall affected one of them, it would appear that it affected all of them, and therefore each of them was entitled to be told what was proposed to be done to the wall, so that if necessary they could look after their own interests—though, in saying that, he appeared to be differing from the opinion of counsel he had just referred to. As to the exercise of rights under an award, he had been under the impression that where an award had been made, a surveyor was entitled to proceed after the lapse of two months; but he had been pulled up in a case where the surveyor to the adjoining owner would not allow him to proceed. If a surveyor could not proceed with the exercise of his rights at the end of two months, then the words to that effect were absolutely unnecessary and misleading. As to the position of the third surveyor, he agreed with Mr. Pilditch that he should be an umpire. He practically was an umpire, and there was no reason why he should not be termed an umpire and act as though he were, and make his award, which award it should not be necessary for the two other surveyors to sign. The third surveyor should be an arbitrator, and he should be required to work under the Arbitration Act, as in the ordinary course of an arbitration. As to the appeal to the Secretary of State, he had himself done so, and within seven days a distinguished member of the Surveyors' Institution was appointed to settle the matter, there being no difficulty whatever about it. He hoped the paper they had heard would be followed by an amendment of the Building Act. The Act was a very respectable Act in its way, but there were needed some amendments to make it more workable.

Mr. F. Newbolt, Barrister-at-Law, said he proposed to deal with the following questions:—1. Are the words "not specially provided for by this Act" (in Section 91) superfluous 2. Are the surveyors appointed under the section to settle differences given jurisdiction to act before the building owner commences his work? 3. Is the third surveyor an umpire? and can the words "such one surveyor" be taken to refer to him? 4. What is the relation of Sub-Sections 10 and 12 of Section 91? These questions were to some extent dealt with by Mr. Pilditch, but he did not direct his attention to two others, viz.:—5. Are the surveyors appointed by the parties and acting with the third surveyor to act as judges or advocates? 6. Have the parties the right to appear before the three surveyors by solicitors or counsel? He regretted that Mr. Pilditch's suggested amendments to Section 91, which, as he said, "incidentally reconcile the wording of the section with common sense and grammar," were not law; until they were, lawyers, as such, had nothing to do with them. He was sorry they did not think that the third surveyor was invariably treated, in fact, as an umpire, for he had come to the conclusion that, notwithstanding the confusion introduced by the decision of V. C. Malins in the case of *ex parte* MacBryde, he was not so in law, but occupied quite a different position. Dealing with Question 1, the words "not specially provided for by this Act" must be understood, it seemed, to mean "not elsewhere specially provided for." He did not think that the phrase was open to the charge of absurdity which Mr. Pilditch brought against it. It seemed to him to be simply superfluous, and to have no meaning at all. If he felt himself at liberty to speculate, he should be inclined to think that either there was at one time in the Bill a special method of assessing compensation under Section 88, afterwards struck out, or that some one inserted the phrase with the intention of striking out the restrictive words which followed, an intention not carried out. With regard to Question 2, he thought the surveyors had jurisdiction to act before the

building-owner commenced his work—notwithstanding the difficulty created by the words "during the continuance of any work"—because they were given power by their award to determine "the right to do . . . any work," and it would not be much use to determine during the continuance of any work, that there was no right to do it. He was therefore not surprised to hear that it was almost invariably the practice for an award to be entered into before the work was begun. As Mr. Pilditch pointed out, the adjoining owner could require security before the building-owner commenced any work, but unfortunately he had to go to the County Court for that, although a totally different tribunal would assess the compensation due to him. He could, however, appeal from the surveyors, when he would find himself back in the County Court, where he would leave him. As to Question 3: "Is the third surveyor an umpire?" He would say certainly not in law, and he doubted if he could be said to be so in fact, for as Mr. Pilditch himself pointed out, a deadlock sometimes threatened because the third surveyor had not the power of signing the award by himself. The third surveyor was independent because he was not appointed by either party; he was appointed by professional men who might know him only by reputation, and who agreed in his appointment because they thought he would act with ability and fairness; but when he was appointed his position was exactly the same as that of the other two. He had no more and no less power than they. He had not to decide disputes between them: he was not the judge to be affected by their advocacy. All three were joint arbitrators or judges, and, if the Act did not specially provide for it, their award would be in law invalid and worthless if signed by only two of them, instead of by all three. It had, Mr. Pilditch said, been recently argued that the words "such one surveyor" referred to the third surveyor just as if the expression was "such third surveyor," but that he doubted the accuracy of this interpretation. Speaking for himself, he could feel no doubt on the point. "Such one surveyor," it seemed to him, could only refer to the "one surveyor," in whose appointment as sole arbitrator both parties concurred. As to the fourth question: "What is the relation of Sub-Sections 10 and 12 of Section 91?" Indeed it was not clear. Where each party had appointed a surveyor the first duty of those two surveyors was to appoint the third, and their not doing so would be apparently neglecting to act. The one not in default would then be entitled to proceed *ex parte* by Sub-Section 12, but for neglect to do this particular act a special remedy had been already provided by Sub-Section 10, and in these circumstances a surveyor would not be well advised to proceed *ex parte*. Sub-Section 10 seemed to contemplate a case in which both surveyors might be in fault, or neither, if they simply could not agree, and the parties might wish to quicken their steps, but he thought it would be unwise not to prefer the special to the general remedy, more especially as "to act," *i.e.*, to act as a surveyor and arbitrator, did not, it might be argued, necessarily include selecting a third surveyor. The fifth question, "Is the surveyor of a party when acting as one of the three surveyors a judge or an advocate?" would surprise any judge of the High Court who happened to hear it asked, as he would wonder how any one could be so ignorant of first principles as to ask it, but ordinary men of business, who never read a law book or a law report, often, he might almost say generally, took the opposite view, and parties to arbitration very often thought that the arbitrators they nominated are appointed to fight for them before the umpire. Unfortunately this very Act, unless carefully examined, seemed to give colour to the suggestion. For by Section 107 it would be found that in an arbitration about a dangerous structure, the surveyor appointed by the owner did properly act as his advocate, as against the District Surveyor, and the third surveyor called in had to decide between their respective "contentions," and the owner had to pay the costs "in the event of such determination being adverse to the contention of the owner's surveyor," but, notwithstanding what seemed a defect in drafting this section (Sub-Section 4), it was clear that when the two surveyors had failed to agree, and had referred the matter in dispute to the third surveyor previously appointed, the latter was *the arbitrator*, *the sole arbitrator*, and the award was made by him alone. He was not an umpire. In such a case it was quite right that the surveyor of the party (generally, he supposed, if not always, the surveyor upon whose advice he decided to fight the County Council) should represent him before the arbitrator, and show why he disputed the necessity of the requisition. But in arbitrations under Section 91 the surveyor was in a different position. In the eye of the law he was a judge, and although he was at liberty to act on his special knowledge he must not forget that his functions were judicial. Judges many and great had over and over again repudiated the notion that a mercantile or non-legal referee could be allowed to act in a way that would be improper in a judge. He saw no reason, from a legal point of view, why the parties should not be represented before the three surveyors by solicitors or counsel. The case he had already cited showed that they were arbitrators—that is to say, a judicial tribunal; and the words of the Act of 1855, under which that case was decided, were reproduced in the present Act. From a practical point of view he should think that the presence of advocates would often be highly inconvenient, as it was not generally, if ever, a question of conflicting evidence which the arbitrators had to decide, and the intention of the Act seemed to be that the surveyors should simply decide in consultation the questions which arose, but when the parties wished to go to the expense of being represented by professional advocates, there was probably something of sufficient importance at stake for the surveyors to hear argument upon it.

Mr. J. Douglass Mathews said it was rather startling that after only four years of the working of the Act, so many difficulties should arise. The explanation given by Mr. Blashill seemed to be a very good one. He (the speaker) did not know what probability there was of an amendment of the Act (such a thing had been talked about), but if it were amended such a paper as they had had from Mr. Pilditch, and such a discussion, would be of much value and make the Act much more workable. Mr. Blashill's remark that there was too little for the surveyor under the Act and too much for the lawyer was an important one. The desire as to party-walls had been to simplify a very complicated matter. Party-wall matters, although simple in treatment, were very difficult indeed to arrange. People seemed to think it was not a partnership affair, as it ought to be. Not the least of the difficulties which had been noticed as to party-walls was that as to notice—the difficulty of giving notice to each owner, and for each owner to be a party to an award. That was particularly the case with buildings occupied as offices, and under different ownership. Each of these occupants was an adjoining owner, and unless they could all agree to one surveyor representing the whole of them there must be as many awards and as many surveyors as there were parties affected by the party-wall. This gave rise to much complication. He had had several cases in his experience in which all the owners agreed to appoint one surveyor to represent them, but that was not, unfortunately, always so, and there might sometimes be half-a-dozen surveyors engaged on one party-wall matter of little importance, with all the consequent difficulties and delays connected with such representation. Of course it was difficult to decide who was the owner, or who the representative owner, for each party had an interest. The present machinery was very irksome, and he should be glad if some other method could be arranged to meet the difficulty. As to party-wall notices, it was a very difficult matter to know what to put into them, for they were prepared two months beforehand, and before the wall was uncovered, and before the building owner knew exactly what he would have to do. That being so, the party-wall notice should be as comprehensive as possible, though not stupidly so. A building owner intended, perhaps, to make greater use of a party-wall than he had done before; or his new building might be a higher building, which would require an extra thickness of the wall; or his desire might be to retain the wall and thicken it. He gave notice accordingly, and, in his (the speaker's) opinion, did wisely not only to give notice to that effect, but also notice to rebuild the wall if necessary. He thought that would be a very fair thing to do, even though there was no immediate intention to rebuild, for when the wall was uncovered and carefully examined it might be found that it would have to be taken down. The same remarks applied to chimney breasts and other matters. But, to quote the powers given to the building owner, without giving the adjoining owner a clue to what was intended to be done, was wrong; he had known cases in which everything was particularised, and he did not think that was intended by the Act. Mr. Pilditch had raised the point whether it was desirable to put in the particular sections of the Act to which the notice applied. It did not appear to him to be necessary. There was a section of the Act which dealt with party-walls, and if they quoted the Act it was sufficient for their purpose. There was no need to tie themselves down to a particular part of the Act, which might not cover all they wanted to do. As to the position of the three surveyors, it had always seemed to him that the tribunal of the party-wall was about as good and simple a tribunal as could well be established. He strongly advocated the desirability of the retention of the third surveyor—they might call him what they liked, but he was the third surveyor. It was very necessary that two of the three surveyors should, generally speaking, agree. The matter was put before the third surveyor, who prepared his award and sent it to both parties, whether the other surveyors agreed or disagreed. There was generally not much difficulty in the end. Very often all the three surveyors agreed, which made it much more satisfactory to all parties. But where there was discord he did not think the matter should be left to the third surveyor, as arbitrator; for he might be wrong, for he could not be infallible. The conference and the necessity for the agreement of two of the three surveyors had considerably lessened the difficulties of the working of the Act. He did not agree that a solicitor or counsel should assist the third surveyor, for if the whole matter were to be argued out before counsel that would be making a court of arbitration of it and the Act did not contemplate that. The tribunal should be confined entirely to the three surveyors; if solicitors and clients were introduced, then the whole matter would have to be fought out. The simplifying of the tribunal and the efficacy of it would to a great extent be lost if questions of law were to arise at every turn. There was one point in reference to the amount of the stamp on an award. It was most unsatisfactory that at the present time the only legal stamp was 35s., for in many cases an award was for a small amount, and although if a sum of the cost of the work was estimated, the stamp would be less, there was so much risk of contingencies that he did not consider it safe to adopt this course.

Mr. H. Lovegrove said that the second definition of a party-wall had often puzzled him. It seemed rather absurd, if a building owner pulled down a party fence wall and on the ground built another wall, to call that wall a party-wall except as regards a party user. The words in Section 95 might have been made a little clearer. He had been glad to hear the expressions of opinion as to party-wall notices. He agreed with Mr. Mathews that, useful as lawyers were in many cases, it was better to keep them away from party-walls. As to Mr. Woodward's remarks about windows being put in the upper part of a wall, he (the speaker) had always held that a party-wall ceased above a height of fifteen inches above the lower building, and if anybody tried to insert windows in the party-wall above a lower building he would contest the matter.

Mr. Howard Chatfeild Clarke referred to the annals of an old City company, and read a minute made in 1667, in which the Court of the company ordered that "Their carpenter is to take a note of all the company's houses lately burnt by the fire, and where they were situated, and to look to the foundations of them and see that the company are not wronged by the building of walls on such foundations as party-walls, when the same belonged only to the company." That was two centuries ago, and it showed that people had then arrived at the point that one could not acquire rights to an external wall where there had been no rights of user. The difficulties Mr. Mathews had referred to were common in practice to all of them. Mr. Blashill's weighty remarks to the effect that there should not be so much antagonism about party-walls seemed to him most pertinent. The wall was in joint occupation, and there was no particular reason why it should be argued between surveyors as though they were advocates. As

to the old and difficult question of how far the right of user of a small enclosure on an external wall made the wall a party-wall, he believed that after a number of years the fact of user made the wall a party-wall. As to general notices, they were very common in that part of the City where he practised, and there was a strong objection to them. In the late case of Hobbs *v.* Grover, he thought that the plaintiffs were justified in asking if the notice given were a legal notice. The words of the Act seemed to state that the nature of the work was to be clearly stated, and that could not be done if that part of the Act in question were simply quoted. He felt a difficulty in Section 91, Sub-Section 1 (which dealt with the question of the award of the surveyors), where it said that they should settle any matter from time to time during the continuance of any work to which the notice related. Could they, after making one award, later on in the work, when difficulties arose, set to work, and make another? It did not seem to him that the Act intended that, for it did not say "award or awards;" and if that construction were admitted into the section, a great deal of trouble would result. As to the position of the third surveyor under the Act, he had never looked upon him as an umpire. When there were difficulties between the two surveyors, it was better for them to talk the matter over with the third gentleman and, as a rule, the result of that talk was that the three surveyors joined in one award, which was stronger when so framed.

Mr. E. W. Hudson said the recent case of Hobbs *v.* Grover showed the necessity for specific wording of notices as to party-walls, setting forth the work to be done so as to enable the adjoining owner to form an idea of what was intended. Of course, there was the difficulty of the building owner himself not knowing what might be necessary until he actually commenced operations on the wall; but the case he had quoted made it clear that even a verbatim notice from the Act of everything that could be done to a wall was, in the opinion of the Judge, vague and indefinite, for the reason that it did not let the adjoining owner know that the wall was to be raised and to what extent. There was a great discrepancy between the Acts in the provinces dealing with party-walls and the Metropolitan Act, and one had to be very careful in the matter. In the country the common law ran side by side with the local Acts dealing with such structures, whereas in the metropolis the common law, unless it was really brought into the Act definitely, had no value. As was generally known, the Royal Institute of British Architects had lately waited upon the Secretary of the Local Government Board with a view to getting the local by-laws put more in accord with those which regulated the metropolis; but, as was to be expected, it was impossible to get any promise of legislation on such a wide subject. But the Local Government Board promised the deputation that so far as the representations of the deputation did not involve fresh legislation, that those representations should have favourable consideration. As to that portion of a wall above the party line of the lower building, there seemed to be a discrepancy in the matter. In the case of Weston *v.* Arnold it was held that the upper part ceased to be a party-wall, and windows were put in; but against that was the case of Williams *v.* Bull, where the upper part was held to be a party-wall—in fact, that it was all a party-wall. Another matter of difficulty was with regard to wall abutting upon a public passage, where the lower portion, one-story high, was an external wall, and the upper portion became a party-wall.

Mr. Pilditch, in the course of a reply to one or two of the points raised in the discussion, said he was somewhat surprised to hear Mr. Clarke remark that he thought that under Section 91 more than one award was not contemplated, and that it was not possible, where one award had been given, and where work was being carried on, for another award to be made by two of the three surveyors. He would like to point out that Section 91 specifically stated that one surveyor or any two of them could settle, "from time to time," what work was to be done, and that seemed to imply that it was possible for the surveyors to make subsequent awards to the original award. In regard to one point raised by Mr. Douglass Mathews as to the difficulty which the building owner's surveyor experienced in defining the work proposed to be carried out and in supplying proper and explanatory notice to the adjoining owner, he (the speaker) quite agreed that an architect or surveyor might, in some cases, find it undesirable to specify exactly what he required to do; but, in the majority of cases, if the architect or surveyor who was acting for the building owner spent sufficient time in going into the question of surrounding boundaries, &c., when preparing the original plans, he would find it quite easy and possible to furnish full explanatory plans or sketches of what he proposed to do, so that it might be attached to the notice. In accordance with the decision of the recent case of Hobbs *v.* Grover, the architect or surveyor had to do so, and as soon as that was recognised the better for the profession. Mr. Newbolt made one or two useful suggestions, from a lawyer's point of view, but he seemed to imply that the three surveyors were specifically and definitely arbitrators—in a legal sense, arbitrators—and quoted a case which implied that they were arbitrators and not, in any sense, acting *ex parte*. He (the speaker) did not see how that could be. Under the Act each surveyor was specifically appointed *ex parte*. The one surveyor was appointed by the building owner, primarily for the purpose of erecting the building, and, incidentally (in ninety-nine cases out of a hundred) for dealing with party-wall cases that arose; he was in the position of a professional man acting for a client. It was just the same with the surveyor acting for the adjoining owner—he was appointed to protect the interests of his client against the building owner and his surveyor; and what could happen by the time the third surveyor was called in to alter the character of the two surveyors and make them legal functionaries and not, in a sense, professional men acting on behalf of their clients? He could not help thinking that the two surveyors, when they called in the third surveyor, must have a natural bias in favour of the client by whom they had been instructed. As to Mr. Newbolt's remarks in regard to his (the lecturer's) statements on the relation of Sections 10 and 12, although he did not quite agree with those remarks, he felt that Mr. Newbolt had thrown a good deal of light on the subject, and had pointed out reasons why it would be improper legally to act on Section 12 in certain cases where Section 10 actually applied. Mr. Woodward had made a successful application to a Secretary of State, and it would be interesting to know which Secretary of State it was. [Mr. W. Woodward: The Secretary of State for the Home Department.] Then he (the speaker) must have made his application to the wrong Secretary of State. He could not quite agree with Mr. Woodward in his remarks as to the two months' limit. Mr. Woodward had said that he had had an award entered into, and at the end of the two months he was not allowed to proceed by it; but the award, though in black and white, had not been signed! In that case, Mr. Woodward had not much to complain of. If it had not been signed in the course of two months, how could Mr. Woodward expect to get it acted upon? If the second surveyor refused to sign the award, then there was the third surveyor, and if he refused, then there was the Home Secretary. As to the point about that portion of a wall built on a party wall, and above the adjoining building, and which became an external wall, there were two cases which seemed to throw some light on it, namely, Williams *v.* Bull (in which the wall itself stood partly upon the land of two adjoining owners), and the case of Crosby Hall, in which case the wall in question stood entirely on the land of one of the owners, and in which it was held that a portion of the wall, up to a certain height, was a party-wall, and could be taken down and rebuilt, but that the portion above the building owner's property was not a party-wall, and could not be taken down; from which, two things followed, viz., that the building owner would have to shore the upper part of the wall, and so build under it; and, secondly, he could not build on it. He had been a little confused by Mr. Woodward's remarks as to the notices necessary to be served on the adjoining owners, for Mr. Woodward had quoted counsel's opinion to the effect that only one notice was necessary, but did not give the ground of that opinion, and subsequently Mr. Woodward appeared to throw over that opinion himself. He thanked the meeting for their attention, and regretted that the late hour did not permit him to deal more fully with the questions raised by other speakers.

The President said that the history of the Building Act was one in which the Institution and many of those present had taken great interest, and Mr. Blashill's description of the way in which the Act had been produced exactly described the course of proceeding taken, and showed how it was that there were so many differences in degree between the present and the preceding Act. An important point that had been mentioned in the discussion that evening was as to the distinction between a party-wall in London under the Metropolitan Building Act and a party-wall in the country. Surveyors in London considered that they had great advantages because each owner of a party-wall had a joint ownership of the whole wall so far as they jointly occupied. In the country, unfortunately, the ownership meant the ownership of a moiety of a party-wall in many cases. He was glad the Royal Institute of British Architects was moving in the matter, for he was of opinion that it would be best if there were joint ownership in a party-wall throughout the country. As to the question of the position of the three surveyors under the London Building Act, he did not think it desirable that they should be mere arbitrators; he thought it best that the two first appointed should act as professional men engaged on behalf of the owners of the two sides of the wall: and as to the question as to what was best for both parties to do, the building owner wished to build as satisfactorily and with as little expense as possible, and the adjoining owner's object was to allow the rights of the building owner with as little interference to himself as possible. It seemed to be thought necessary that, in order to obtain a fair statement of the rights of the two sides of a party-wall, advocates should be employed, but when advocacy had stated both sides of the question it was desirable that a third person should be called in to act to a great extent as an umpire. But such an umpire was only selected for his experience. He thought that to change the position of the two surveyors and make them mere umpires would not be a great advantage, and he hoped the present arrangement would continue. He wished there were some power given under the Building Act for difficult points arising out of the Act being reported every few years, with a view to obtaining such alterations to the Act as practice showed to be necessary.

It was announced that the next meeting will be held on January 15, when a paper on "Forest Management, with Suggestions for the Economic Treatment of Woodlands in the British Islands," will be read by Mr. John Nesbit.

The meeting then terminated.

INSTITUTE OF SANITARY ENGINEERS.

The annual dinner of the Institute of Sanitary Engineers (Incorporated) was held on Wednesday evening at the Holborn Restaurant. Mr. J. Farley presided in the absence of the President, Mr. R. Reynolds Rowe, through illness. Among those present were: Messrs. W. J. Wells, H. M. Dove, and S. Minty (vice-presidents); and Messrs. S. I. Adams, F. J. Rayner, C. E. Butcher, J. T. Griffin, F. P. Barber, C. Dobbs, N. W. Hoskins, W. E. Markham, and E. R. Palmer (members of the council), and Mr. J. Kemsley, secretary.

"The Army, Navy, and Reserve Forces" was proposed by Mr. Adams. Mr. Minty responded.

Mr. E. A. Brayley Hodgetts proposed "The Institute of Sanitary Engineers" and "The Chairman and Members of the Council." He said the Institute was already successful, and it was certain to have even increased prosperity in the future, because its basis was national health. At the present time there were 700 members. Within a very short time, he was glad to say, the Institute would have new offices, which would be more central. They would have a museum attached, and a smoking room, in which the members could exercise their ingenuity to invent an efficient system of ventilation.

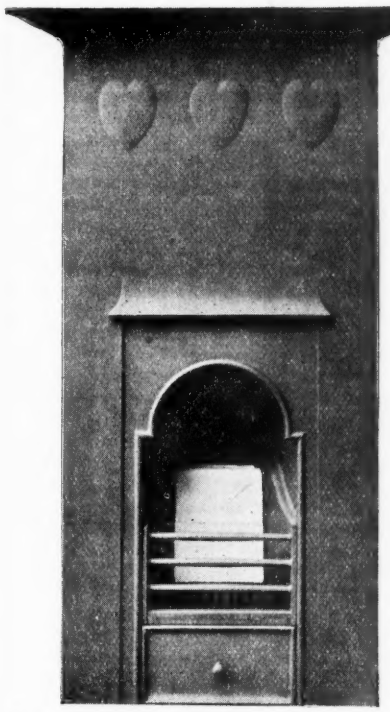
The Chairman, in reply, said that so far as the Institute was concerned the tide had turned. The past year had been very successful, and during this period seventy new members had been enrolled. A little more than two years ago they all received a very severe shock. They were in the position of having bought a house, and instead of having vacant possession

they found there was a tenant to be got rid of They first sought an ejectment order, but this was a difficult and tedious matter. Eventually terms were suggested, and the difficulty was overcome. It was necessary to clean the Institute premises out from cellar to garret, but it was only a question of time, and if all the members worked together there was no reason why they should not stand as high as any institute in England. Their object in starting the Institute was to give an opportunity of social intercourse and the mingling of theory and practice. It was proposed to discuss at future meetings the sanitary problems of the cottage, villa, and mansion, with the idea of laying down lines to guide the members. It was hoped that in time the Institute would be sufficiently strong to expel any member who disobeyed any of the rules. They wanted to make sanitary practice as uniform as possible, so that there would be no likelihood of one inspector condemning work which had been passed by another.

The Chairman proposed the "Visitors," which was responded to by Mr. Reveirs.

GRATE: DESIGNED BY MR. C. F. A. VOYSEY.

THIS simple but elegant grate front has been designed by Mr. Voysey for the Falkirk Iron Company, who by their wise action in going to good designers are doing so much to improve this class of work in an artistic sense, as well as improving their own position as manufacturers.



Grate: Designed by Mr. C. F. A. Voysey for the Falkirk Iron Co.

ARCHITECTURAL SOCIETIES.

LIVERPOOL ARCHITECTURAL SOCIETY.—In sending us their programme of papers for the present session, the President and Secretaries draw our attention to the alteration which has been made in the character of certain of the meetings. The alteration consists in constituting the alternate evenings "members' meetings," in distinction from the "ordinary meetings," and selecting a separate chairman for each of the members' meetings, who will sum up the discussion at the close. The object is to encourage the younger members of the Society by giving them better opportunities for reading papers and joining in the discussions. The members' meetings are to be held in the smaller room belonging to the Society, and smoking is to be permitted. The list of papers still to come is as follows: Ordinary meetings:—Paper by Mr. Herbert Bryans on "Stained Glass" (January 8); paper by Mr. Arthur Stratton on "Santiago de Compostella" (February 5); paper by Mr. A. Saxon Snell on "Public Baths and Wash-houses" (March 5); paper by Mr. E. P. Hinde, "Notes on School Buildings" (April 2); and closing address by the President, Mr. E. A. Ould (May 7). Members' Meetings:—Paper by Mr. G. W. Fraser, "Stained Windows and their Treatment" (December 18), Mr. T. E. Eccles in the chair; paper by Mr. H. Honan, "Doors and Doorways" (January 22), Mr. A. P. Fry in the chair; paper on "Local Building Stones" (February 19), Mr. T. M. Reade in the chair; and paper on "Roofs and Roofing" (March 19), Mr. P. C. Thicknesse in the chair.

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.—The ordinary monthly meeting of this Society was held at the School of Art on the 12th inst. The President (Mr. Joseph Smith) was in the chair. A ballot was taken, and the following gentlemen were elected Associates: Messrs. R. B. Brook Greaves, H. S. Hague, G. Osborn; and, as student, Mr. H. Appleby. Professor T. Roger Smith, of London, then delivered a lecture on "Oriental and Indian Architecture." He began by pointing out the differences between Western and Eastern architecture and art generally, resulting largely from difference in race, in climates, and in religion. The earliest monuments in India were topes or mounds for the preservation of sacred relics. These are Buddhist, and date back to before the Christian era. Round these are procession paths, enclosed by great posts and rails in stone, imitating timber, and profusely enriched. The carving from the Amravati tope, now in the British Museum, was elaborate and extensive. Bhuddism was succeeded by the Jain religion and architecture, whose temples included high roofs and domes, and furnished suggestions for what followed. In all Indian architecture profuse ornament and constant repetition were invariable. The high pyramidal roof was constantly met with, also the pier and bracket. Another feature of constant occurrence was slabs of stone perforated in patterns to fill in the windows. Most of the great temples stood in an extensive enclosure, with gateways, with high roofs. Next came the true Hindu temples, which differed in the North and South of India; the high roofs in the North were straight sided and profusely ornamented, while in the South lofty gourd-shaped domes were employed, differently ornamented. The Saracenic or Mohammedan architecture, which was the next type, introduced by Mogul invaders in the eleventh century, had its origin in Arabia, Egypt, and Syria. The lecturer described the nature of a mosque, pointed out the early introductions of the pointed arch Mohammedan buildings in Delhi, Ahmedabad, and Agra, and went on to describe in detail the Taj at Agra. The lecture was illustrated by lantern photographs of temples in various parts of India, and of the Buddhist tope at Sauchi, and of Saracenic buildings in Cairo and in India. A vote of thanks was accorded to the lecturer on the motion of Mr. E. M. Gibbs, seconded by Mr. J. R. Wigfull, and supported by the President and Mr. H. L. Paterson.

GLASGOW ARCHITECTURAL CRAFTSMEN'S SOCIETY.—The annual meeting of this society was held on Friday, December 8, when a paper by Mr. D. Bennet Dobson was read on "Graphic Calculations." The lecturer divided his subject into eight sections, viz., reactions, moment of resistance, shearing stress, graphic arithmetic, wood beams, cast-iron beams, rolled iron beams, steel beams. Taking each of these sections in turn, he worked out examples on the blackboard in a very rapid and concise manner, giving the simplest methods of working out the examples and their variations. The President, in proposing a vote of thanks to Mr. Dobson, spoke of the many entirely new methods he had shown, and trusted that the Society would soon have the pleasure of seeing his present lecture and the one given last year on "Calculations Simplified," in book form.

BOOKS RECEIVED.

UNWRITTEN LAWS AND IDEALS. By various writers. Edited by E. H. Pitcairn. (Smith, Elder, & Co.)

RELICS OF OLD LONDON; drawn by T. R. Way, with introduction and descriptions by H. B. Wheatley. (Geo. Bell & Sons.)

WHO'S WHO, for 1900. (Messrs. A. and C. Black.)

THE CHURCH HOUSE, WESTMINSTER. — The builders are now engaged on the second block of the permanent buildings of the Church House, Westminster, in accordance with the plans which were revised by the late Sir Arthur Blomfield. It is estimated that the cost will be 20,000*l*.

ARCHÆOLOGICAL SOCIETIES.

ROYAL ARCHÆOLOGICAL INSTITUTE.—A general meeting of this Institute was held on Wednesday, the 6th inst., Mr. Emanuel Green in the chair. Mr. James Hilton, F.S.A., exhibited a seal or stamp of Chinese make formed as a square die 1½ in. in size, surmounted by a monster animal as a handle, all carved in ivory. The stamp shows a device or inscription in some form of Chinese or Mongolian characters. A drawing of a somewhat similar stamp, reported as made of "red jade," having been sent through a member of the Institute to elicit some explanation from the meeting, the ivory example was exhibited to help a discussion. It seems that officials, merchants, and others in China use such stamps to authenticate their papers more effectively than by written signatures, which to an ordinary Chinaman are unintelligible. More information about the "red jade" seal will be sought for, as at present it seems to be a most rare object.—Mr. Harold Brakspear read a paper on Lacock Abbey Church, Wiltshire, which was founded in 1232 by Ela Countess of Salisbury for Austin Canonesses. He briefly described the existing buildings round the cloister, which, except the west range, are practically perfect to their roofs, and compared them with the sister Abbey of Burnham. The site of the Abbey church, which has been entirely destroyed except its north wall, was excavated a year ago, and was found to have been an aisleless parallelogram, 143 ft. by 28 ft., vaulted in seven bays. A lady chapel, 59 ft. by 25 ft. 6 in., was added in 1315 on the south side, the building agreement for which still exists. Mr. Brakspear described the internal arrangements and details of the Abbey church and chapel and the plan, which he exhibited in illustration. Mr. W. H. St. John Hope took part in the discussion.—Mr. G. E. Fox, F.S.A., read a paper on "Roman Suffolk," being the second part of a previous paper on the same subject read at the meeting of the Royal Archæological Institute at Ipswich in July last. The paper was devoted to an examination and description of the various remains in the county, indicating the presence of population in the Roman period, and showed under the following heads what traces had been discovered of the former existence of the dwelling-places of the people in that period, viz., finds of pottery and building material, fragments of buildings, wells, rubbish pits, single sepulchral deposits and cemeteries, and hoards of coin. The traces of handicrafts discovered within the bounds of the county were also described, and, in some detail, certain of the more interesting finds.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—The third meeting of the session was held at 32, Sackville-street, Piccadilly, on the 6th inst., Mr. C. H. Compton, V.P., in the chair. Mr. R. Quick, Curator of the Horniman Museum, read a paper he had prepared upon "The Eolithic Stone Age," which was illustrated by diagrams and a large number of specimens of flint implements. Mr. Quick said it was the opinion of many archæologists some eighteen or twenty years ago that the Palæolithic Age was the most ancient period yielding decisive proofs of the existence of man. Since then great discoveries have been made, and most scientific men now divide the Stone Age into three epochs respectively, (1) the Eolithic or Dawn of the Stone Age, (2) the Palæolithic or Early Stone Age, and (3) the Neolithic or Later Stone Age. Upon the plateaux of North Kent, some twenty or thirty miles distant from London, at heights varying from 400 ft. to 800 ft. above the sea level, many thousands of specimens of flint implements have been discovered and carefully collected and classified by Mr. Harrison, of Ightham. They differ in type from the implements found in the river gravels or the polished tools of the Later Stone Age. A noticeable feature of difference between the types is the absence of the large massive implements common to the Palæolithic period. The implements found on the plateaux are mostly of small size and fitted for use without a haft, the heads also are generally worked round all the edges, so that they could be used in different positions and on all sides. The Eolithic implements may be termed the prototypes of the later implements. Early man did not consider form of importance; he wanted something that he could hand-grip and use as an edged tool. Nature probably suggested the form most suitable amongst these flints for his purpose, and a little working

of his own upon them gave him all he needed for his simple habits. Many of the implements are naturally split flints which have been worked on one side only, the chipping, or working, being generally of a character such as could not have been produced by accident or by natural causes, and this chipping appears always on the side opposite to a good hand-grip, which fact must have been an important consideration with the primitive man.—The Chairman, Mr. Gould, Mr. Williams, Mr. Rayson, and others joined in the discussion following a very interesting paper.

M. DALOU'S "TRIUMPH OF THE REPUBLIC."

IN giving the illustration of this work last week, we should have said that the photograph was reproduced "by permission of the 'Syndicate de la Propriété Artistique,'" of Paris; but we did not receive this intimation till after our last issue was printed.

Illustrations.

FRONT, No. 54, PARLIAMENT-STREET.

THIS building consists of sub-basement, basement, ground floor, and four floors over. Ground-floor, basement, and sub-basement are used by Messrs. Grindlay & Co. for their business purposes. The banking-room is panelled in oak 13 ft. 6 in. high. The upper floors are occupied as offices and caretaker's apartments.

The building is fireproof throughout, and the roof is constructed wholly of iron and concrete, being covered towards the front with Westmoreland slate. The ground floor is of grey Aberdeen granite from the quarries of Messrs. John Fife, and was worked by them. It is emery-rubbed to a fine face, with no artificial polishing. The remainder of the front is of Portland stone with Bazley White's thin red brick facings. The electric lift is by the Otis Company, the ornamental gates and iron grilles up the front by Messrs. Evered & Co. The builders were Messrs. Grover & Son.

The architect is Mr. Alfred Williams, of London. The drawing was exhibited at the last Royal Academy exhibition.

BRITISH HOME AND HOSPITAL FOR INCURABLES, STREATHAM.

THIS institution is situated on a site close to Streatham Common.

The present additions consist of a south wing, with a lofty stone porch of three stories, rooms for additional patients and attendants, a large recreation hall for patients, and a spacious store in the basement.

The original buildings were designed by the late Mr. Causton, and on his death were completed by Mr. Edwin T. Hall, who is the architect of the new wing.

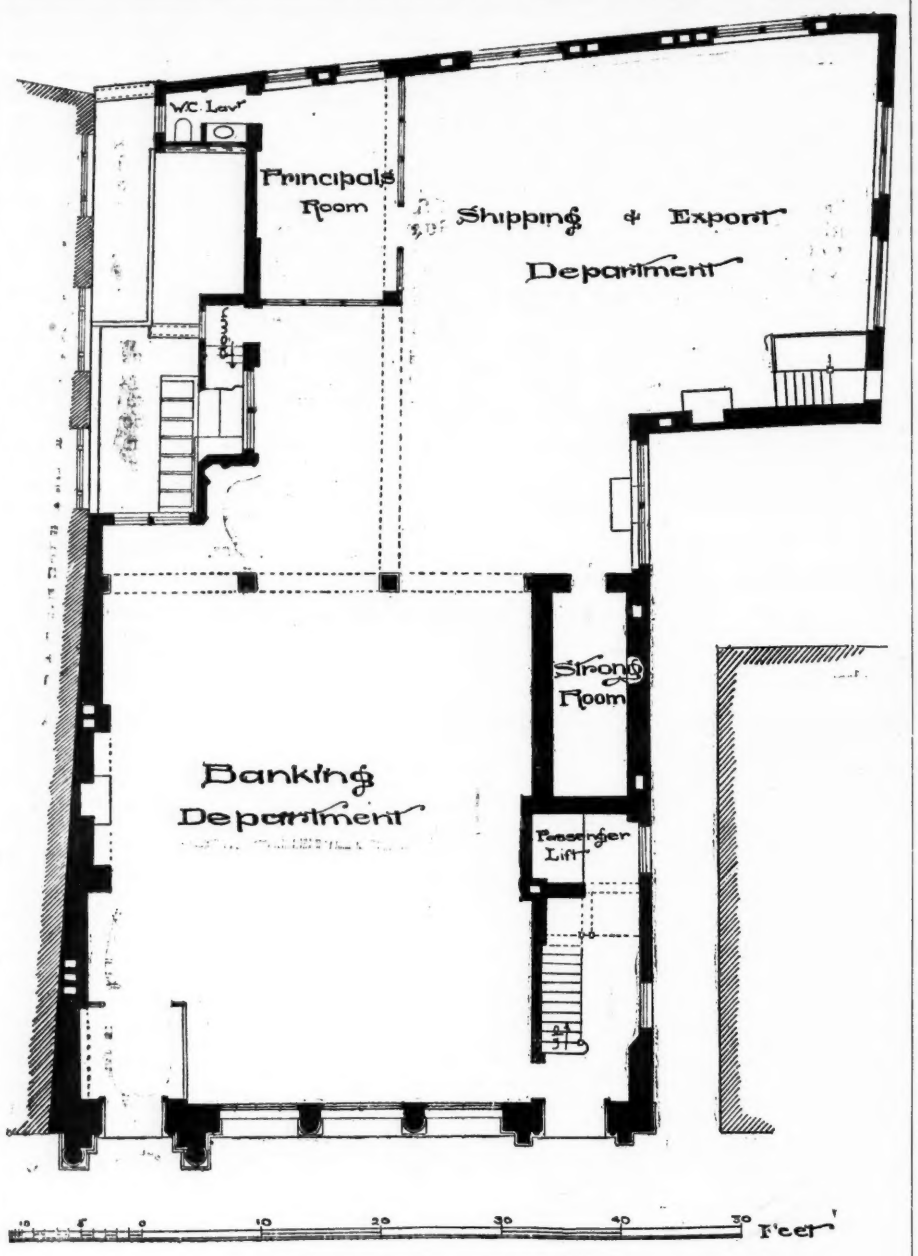
Internally the recreation hall has a segmental vaulted ceiling, divided into panels by ribs masking the roof principals, which are carried on Ionic pilasters. At the level of the first floor of the main building, at the north end, is a gallery, to which patients can be wheeled from their rooms. At the south end is a stage, and beneath this are dressing-rooms, access to which from the outside is obtained by doors at the road level. The main entrance for patients is from the entrance hall, and there are emergency exits on the east and west sides. The building will be lighted by electricity. The architect is also adding a flèche to the chapel, a feature which much helps the general composition.

The buildings are faced with red bricks, the dressings being of Doulting stone. The roofs are of brown tiles. The contractors are Messrs. Marriage & Co., of Croydon, and Mr. A. W. Ball is the clerk of works. The carving has been executed by Mr. Bradford, the electric lighting by Messrs. Laing, Wharton, & Down.

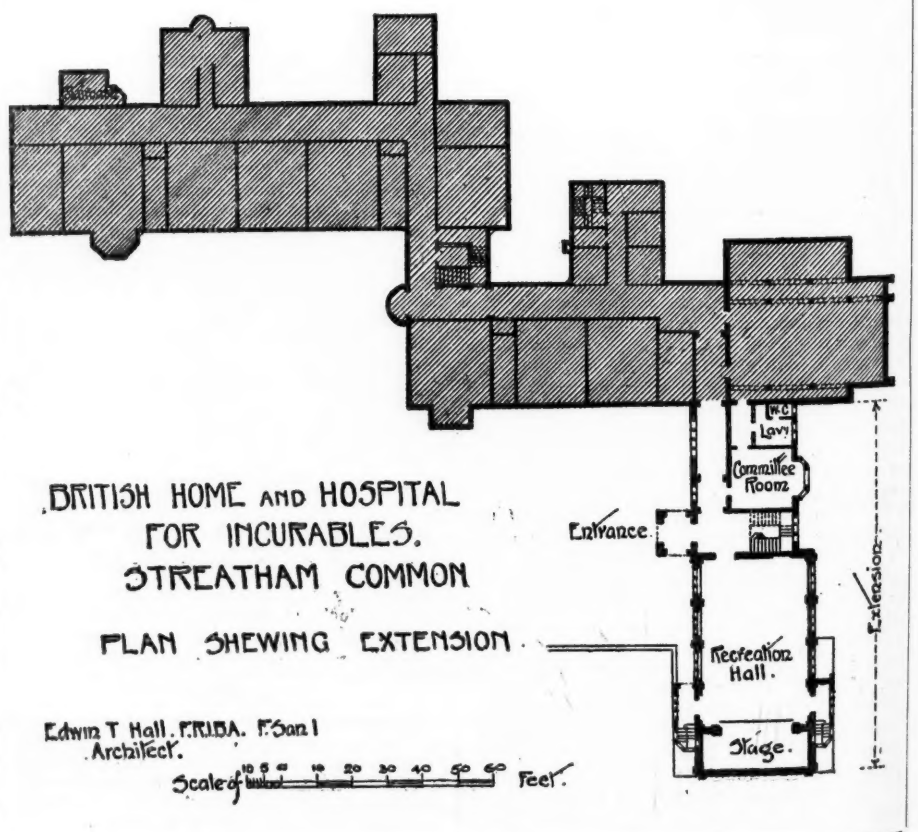
The drawing from which the illustration is taken was exhibited at this year's Academy.

INTERIORS, AUDLEY END.

THE two interiors from this celebrated house are given this week with special reference to Mr. L. A. Shuffrey's paper on "Ceilings," read before the Liverpool Architectural Society, and of which a report is given in another colum n



No. 54, Parliament-street. Plan.



They serve to show the effect of the ceilings as viewed in connexion with the room.

TEXTILE DESIGNS BY THE LATE WILLIAM MORRIS.

THESE designs are reproduced from the actual textiles carried out by Sir Thomas Wardle & Co. from designs by Morris. They were shown at Sir Thomas Wardle's recent lecture at the Architectural Association, as examples of modern textile work, and we are glad to take the opportunity of including them in our illustration plates, as admirable examples for students in decorative art.

THE ROYAL ACADEMY.

THE President of the Royal Academy, Sir E. J. Poynter, on Saturday evening last distributed the prizes to the successful students of the Royal Academy Schools. The following is a list of the prizes and prize-winners.

Historical painting (Ladas, winner of the long foot-race at Olympia, falling dead as he goes to receive the crown of victory), gold medal and travelling studentship (200*l.*).—F. Moss Bennett.

Landscape painting, "The Incoming Tide," Turner gold medal and scholarship (50*l.*).—F. Appleyard.

Landscape painting, "A Path Through Trees," Creswick prize (30*l.*).—A. G. Ackermann.

Painting of a figure from the life (open to male students only), silver medal, 1st, F. E. Colthurst; silver medal, 2nd, O. Crompton.

Painting of a head from the life, silver medal, 1st, F. Appleyard; silver medal, 2nd, C. D. Williams.

Painting of a draped figure (open to female students only), silver medal, 1st, Florence E. Chaplin; silver medal, 2nd, Harriet E. Thomas.

Cartoon of a draped figure (Justice), silver medal and prize (25*l.*), F. Cadogan Cowper.

Design in monochrome for a figure picture (Abraham about to sacrifice Isaac), Armitage prize, 1st (30*l.*) and bronze medal, F. Appleyard; Armitage prize, 2nd (10*l.*), C. Gilbert J. Holiday; extra prize (8*l.*), G. Murray.

Design for the decoration of a portion of a public building (Spring Driving out Winter).—Prize (40*l.*), F. Appleyard.

Set of six drawings of a figure from the life (open to male students only).—1st prize (50*l.*) and silver medal, not awarded; 2nd prize (25*l.*), J. P. S. Streatfield; 3rd prize (15*l.*), F. G. Swaish; 4th prize (10*l.*), C. D. Williams (disqualified owing to having received a superior prize in the same competition before).

Drawing of a head from the life.—Silver medal, 1st, Frederick George Swaish; silver medal, 2nd, Gertrude Lindsay.

Drawing of a statue or group.—Silver medal, 1st, F. G. Swaish; silver medal, 2nd, F. S. Eastman.

Perspective drawing in outline (open to painters and sculptors only) (The Staircase leading to the Exhibition Galleries, as seen from the Entrance Hall of the Academy), silver medal, no competition.

Composition in sculpture (Æneas leaving Troy), gold medal and travelling studentship (200*l.*), G. W. Bayes.

Model of a design (A Greek Soldier protecting a Wounded Comrade), 1st prize (30*l.*).—A. C. White; 2nd prize (10*l.*), M. J. Brown.

Set of four models from the life (open to male students only).—1st prize (50*l.*) and silver medal, A. B. Pegram; second prize (20*l.*), C. L. Hartwell.

Design for a medal (Saving of Life at Sea; reverse—an ornamental shield, with space for inscription).—Silver medal, no competition.

Model of a bust from the life (open to female students only).—Silver medal, 1st, not awarded; silver medal, 2nd, Winifred F. Hunt (disqualified owing to having received the same prize before).

Model of a statue or group.—Silver medal, 1st, C. J. Pibworth; silver medal, 2nd, Mary C. Buzzard.

Design in architecture (a public school for 200 boys).—Gold medal and travelling studentship (200*l.*).—Horace Charles Hide.

Set of architectural drawings (four bays of the S.E. angle of the Cloisters of Westminster Abbey).—Silver medal, 1st, Francis W. Newman; silver medal, 2nd, G. T. Smith.

Set of architectural designs (upper school), prize (25*l.*), H. Inigo Triggs.

Set of drawings of an architectural design (lower school), prize (10*l.*), F. W. Newman.

Plan of a building (a house in a London-street between party walls), prize (10*l.*), J. B. Fulton.

Original composition in ornament, silver medal, no competition.

Perspective drawing in outline (open to architects only) (The Three Central Bays of the Front of Whitehall), silver medal, no competition.

The Landseer scholarships in painting and sculpture of 40*l.* a year each, tenable for two years, have been awarded—in painting to George Murray, F. Appleyard, and E. H. Shepard (extra); in sculpture, to A. Stanley Young and Harry Price (extra).

ENGINEERING SOCIETIES.

THE INSTITUTION OF CIVIL ENGINEERS.—At the ordinary meeting on Tuesday, Sir Douglas Fox (President) in the chair, the paper read was on "Combined Refuse-Destructors and Power-Plants," by Mr. C. Newton Russell, Assoc.M.Inst.C.E. The paper dealt with the subject of refuse-destruction, particularly in reference to its employment for raising steam, and gave details of ten combined plants, the data of which all tended to prove that a considerable amount of energy in the form of heat was to be obtained from the burning of ordinary domestic refuse. The results obtained from eight combined plants in England and two abroad were given, the Shoreditch plant being dealt with in considerable detail, as being the largest of its kind in operation. The total amount of refuse destroyed during a period of twelve months was about 26,000 tons, of which 92 per cent. was ordinary domestic refuse, and 8 per cent. trade refuse, consisting of straw, paper, &c. The latter was practically useless for steam-raising. The plant consisted of six Babcock-Willcox water-tube boilers and twelve refuse-furnaces of the Manlove-Alliot type, each boiler being placed between two refuse-furnaces, the hot gases from which were led into the boiler-tubes through short side-flues, each boiler being provided with a special grate, on which coal might be burned if required. The refuse, on arrival at the works, was carefully weighed, and was afterwards shot, without sorting, into trucks which were raised by electric lifts (of which there were two) to the top platform. On arrival at this point the truck, which was on wheels and fitted with an electric motor, was run off the lift, on the overhead trolley system, to any position where it was desired to empty it; the refuse was then tipped into special charging trucks, one of which was provided for each furnace, and which was operated from the top platform by means of chain gearing. The average amount of refuse received per day was 84 tons, delivered between 9 a.m. and 5 p.m., although as much as 140 tons had been received in one day. It appeared to be impossible in ordinary working to guarantee a regular supply, and it was advisable to provide means of storage to cope with extra large deliveries. This difficulty was met at Shoreditch by means of a large rectangular iron storage-bin fixed under the tipping platform, and holding about 60 tons of refuse. The lifts and trucks were operated entirely by electricity. Forced-air draught was supplied to the fires by electrically-driven fans, the pressure in the ashpits being 1 in. of water. No coal or other fuel was mixed with the refuse, which burnt freely; the maximum temperature observed being 2,500 deg. Fahr., and the average 1,500 deg. Fahr. Considerable inconvenience was experienced owing to cold air rushing into flues during clinkering operations, the trouble being to a great extent unavoidable, and called for a perfect system of dampers. The clinker residue amounted to 32 per cent., and was at present difficult to dispose of owing to the cartage from works to the outskirts of the town being high. The clinker was suitable for making mortar-concrete, and, when ground and mixed with Portland cement, made excellent paving slabs. The works were managed on the eight-hour shift system, seven days per week. The feed-water for the boilers was drawn cold from storage-tanks by three-throw pumps, which forced it through economisers placed in the main flues, where it was raised to a temperature of about 200 deg. Fahr., depending upon the heat of the flue-gases and condition of economiser. The water was then forced upwards into a large feed-water storage-cylinder, 30 ft. by 8 ft., fixed about 20 ft. above the boilers, and was connected direct to the main steam line, and which was therefore at the same temperature and pressure as the boilers, which were fed directly from this cylinder by gravity, the water flowing into the boilers freely without any strain or racking action on the check-valves. The steam generated in the boilers, at an average pressure of 140 lbs. per square inch, was disposed of mainly by the engines attached to the electric generators, although a small portion of live steam was supplied for clothes-washing purposes to the public baths and washhouses adjoining the electricity works; exhaust steam was also supplied to the Baths and Free Library, which were entirely heated from the steam raised by the refuse-destructor. The average cost of burning the refuse during the second year of working, including four furnace men, two top men and one charge man, supervision clerks, &c., cleaners and yard men, repairs, stores and sundries, was 2s. 6·9d. per ton. The amount of electric energy absorbed in dealing with the refuse, including electric fans, lifts, trucks and lighting, was 4·98 Board of Trade units per ton per annum. A number of evaporative tests had been taken with the result that with one boiler and two refuse furnaces it was possible, by the burning of ordinary refuse to evaporate 2,888 lbs. of water per hour from and at 212 deg. Fahr. The average calorific value of various tests was 0·99 lb. of water per 1 lb. of refuse. The heating surface of each boiler was 1,300 square feet, the refuse grate-area was 25 square feet, and the coal grate area was 27 square feet. The total amount of energy sold by meter to consumers was 1,031,348 Board of Trade units, including 131,140 units supplied to the refuse-destructor. The total amount of refuse burnt was 26,201 tons, and of coal consumed 1,344 tons (value 1,308*l.* 14s. 8d.). The item of cost per ton for interest and redemption of land and plant—not usually considered in connexion with refuse-destructors—was a matter for serious consideration, and in the case of the Shoreditch destructor plant—where land is very expensive—the charge worked out at practically 1s. per ton.

SOCIETY OF ENGINEERS.—The forty-sixth annual general meeting of the Society of Engineers was held on Monday, at the Rooms of the Society, 17, Victoria-street, Westminster. The chair was occupied by Mr. John Corry Fell, President. The following gentlemen were duly elected by ballot as the Council and Officers for 1900, viz.:—As President, Mr. Henry O'Connor; as Vice-Presfdents, Messrs. Charles Mason, Percy Griffith, and James Patten Barber; as Ordinary Members of Council, Messrs. Joseph Bernays, D. B. Butler, G. A. Pryce Cuxson, W. H. Holttum, R. St. George Moore, Nicholas J. West, Joseph William Wilson, and Maurice Wilson; as Hon. Sec. and Treasurer, Mr. George Burt; as Hon. Auditor, Mr. Samuel Wod, F.C.A. During the scrutiny the President addressed the meeting, bringing before the members the salient points of the work of the past year. He also announced that the following premiums had been awarded by the Council for papers read during the past session, viz.:—The President's Gold Medal to Mr. E. Wynter Wagstaff for his paper on "The Shan Hill Country and the Mandalay Railway;" the Bessemer Premium to Mr. R. G. Allanson-Winn for his paper on "Foreshore Protection, with Special Reference to the Case System of Groyning;" a Society's Premium to Mr. Gordon Harris for his paper on "Water Supply to Country Mansions and Estates;" and a Society's Premium to Mr. Ewart C. Amos for his paper on "Machine Tools." A vote of thanks was accorded to the Scrutineers, and the proceedings terminated by a vote of thanks to the President, Council, and Officers for 1899, which was duly acknowledged by the President.

BRITISH ASSOCIATION OF WATER WORKS ENGINEERS.—Mr. W. H. Brothers having resigned his position as Secretary to this Association the Council have invited Mr. Percy Griffith, C.E., of Westminster, to take over the duties for the twelve months commencing November 30. As some difficulty has been experienced in finding a suitable successor to Mr. Brothers, Mr. Griffith has agreed to accept the appointment, and it is requested that all correspondence with reference to the Association should be in future addressed to him at the offices of the Association, 54, Parliament-street, Westminster. It has been

decided to hold the winter meeting in February next in London, full particulars of which will be shortly announced. In accordance with a recent resolution of the Council the ballot for President and Officers to take office next summer will be taken at this meeting.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring Gardens, Lord Welby, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend the Whitechapel District Board 10,000*l.* for electric lighting purposes, the Chelsea Vestry 7,000*l.* for the purchase of Lindsey Wharf, the Limehouse District Board 7,270*l.* for improvements, the Newington Vestry 15,500*l.* for electric lighting purposes and 3,000*l.* for sewer work, and the St. Pancras Vestry 24,720*l.* for electric light purposes.

Band Stands, Battersea Park and Victoria Embankment Gardens.—The Council approved the two supplemental estimates for 31*l.* 8s., and sanctioned the payment of an addition of 10 per cent. upon the amount of the tenders of 314*l.* of Messrs. McDowall, Stevens, & Co. for the erection of the superstructures of the new band stands for Battersea Park, and the Victoria Embankment Gardens in consideration of the period which lapsed between the submission of the tender and the sealing of the contract by the Council, and the fact that during that period the cost of ironwork was several times increased.

Rutty's House.—Rutty's House in Bromley recreation ground again led to discussion. The Parks and Open Spaces Committee recommended that the house be cleared away and the site laid out as part of the recreation ground.

Mr. Renwick Seager moved an amendment to refer the matter to the General Purposes Committee for a report upon the uses to which the house might be devoted.

Mr. Granville Smith seconded the amendment.

Mr. Davies said the matter had already been before the General Purposes Committee.

Lord Hardwicke announced that he was a convert to the party who desired the preservation of the house.

Mr. Nathan Robinson ridiculed the idea of preserving a musty, tumbledown relic of very dubious authenticity.

The amendment was rejected by four, and a further amendment was also defeated. The Committee's recommendation was ultimately carried.

Tenders.—The same Committee reported that they had obtained the following tenders for fencing at Christchurch Garden, Spitalfields:—W. Hayward & Sons, Limited, 180*l.*; Hill & Smith, 190*l.*; McVey, Rennie & Co., 192*l.* 10s.; L. Faulkner & Sons, 224*l.*; David Rowell & Co., 226*l.* 12s. 10d.; E. J. Raybould & Co., Limited, 243*l.*; John Elwell, 246*l.* 5s. The tender of Messrs. W. Hayward & Sons, Limited, was accepted.

Fire Station, Shepherd's Bush.—On the recommendation of the Fire Brigade Committee it was agreed that the estimate of 12,980*l.* to be submitted by the Finance Committee in respect of the erection of the proposed Shepherd's Bush station be approved, and that tenders be invited for the work.

The Council's Parliamentary Bills.—Mr. Cornwall moved that the following Private Bills promoted by the Council should be approved:—The Compulsory Purchase of Land Bill, General Powers Bill, the Improvements Bill, the Tramways Bill (Nos. 1 and 2), the Spitalfields Market Bill, Rotherhithe and Ratcliff Tunnel Bill, Gas Light and Coke, Commercial Gas, and South Metropolitan Gas Companies Bill, London Water Purchase, and Welsh Supply Bills. The recommendations were agreed to.

Site for Educational Purposes, Clare Market, Strand.—It was agreed that the land in Clare-Market, Strand, be transferred to the Technical Education Board, upon condition that the same be retained in perpetuity for the purposes of the Technical Instruction Acts, and that the sum of 14,770*l.* be fixed as the value of the land for that purpose.

The Council, having transacted other business, adjourned.

APPLICATIONS UNDER THE LONDON BUILDING ACT, 1894.

AT the meeting of the London County Council on Tuesday, the following applications under the London Building Act were considered. Those applications to which consent has been given are granted on certain conditions. Names of applicants are given in brackets. Buildings are new erections unless otherwise stated.

Lines of Frontage and Projections.

Kensington, North.—A one-story porch and baptistry in front of the proposed new Church of St. Columb, on the south side of Lancaster-road, Notting Hill (Mr. C. H. Fowler, for the Rev. P. H. Leary).—Consent.

Battersea.—Re-erection to an increased height of the one-story shops at Nos. 28, 30, and 32, St. John's-road, Clapham Junction, Battersea (Mr. J. W. Chapman, for Messrs. Gardiner & Co.).—Consent.

Peckham.—Four houses with one-story shops, on part of the forecourts of Nos. 190 and 192, Rye-lane, Peckham (Mr. A. Garnar for Messrs. W. Hall & Co.).—Consent.

Lines of Frontage and Construction.

Southwark West.—An open iron gateway at the factory, The Grove, Southwark (Messrs. J. D. Mathews & Son, for Messrs. Barclay & Fry, Limited).—Consent.

Deviation from Certified Plans.

Marylebone, East.—A deviation from the plans sanctioned on July 26, 1898, for the rebuilding of Nos. 116 to 132 (even numbers only), Oxford-street, and Nos. 1 to 5, Wells-street, St. Marylebone, by an alteration in the arrangement of the lavatories at the rear of No. 122, Oxford-street (Mr. J. Slater).—Consent.

Cubical Extent.

Finsbury, East.—Erection at No. 55, Cow-cross-street, Smithfield, of a building to exceed in extent 250,000 but not 450,000 cubic feet, and to be used only for the purposes of the trade of distillers and wine merchants (Mr. E. W. Mountford for Booth's Distillery Company, Limited).—Refused.

The recommendations were in accordance with the views of the Local Authorities.

Books.

Handbook for Somersetshire. London: John Murray. 1899.
Handbook for Wilts and Dorset. London: John Murray. 1899.

IN the fifth edition of "Murray" for Somerset, Wilts and Dorset, a great improvement has been made over former editions by dividing them into two volumes, Somerset taking one, and Wilts and Dorset the other. Additional information has increased the size, and the division, therefore, has rendered them far more portable. The same general scheme has been retained of dividing the guides into "routes," and in each volume these are prefaced by an introductory chapter dealing with the history, physical features, archæology, and points of architectural interest. All three counties are exceptionally interesting architecturally.

Somersetshire is well known as one of the richest counties for both ecclesiastic and domestic work, and the counties of Wilts and Dorset are also of exceptional interest and partake much of the characteristics of Somersetshire work, especially in places bordering on the latter county. The architectural descriptions in these guides seem accurate, and are always concise. We notice that a monument of the Botreaux family, at Aller, in Somerset, is described as an effigy. It is, however, an incised slab with a shield of arms and inscription, although an effigy (not apparently of a Botreaux, but doubtless also in the church at one time) is now in the churchyard. The maps, both of the counties as a whole, inserted in pockets in the covers, and those of special districts introduced with the text, leave little to be desired for clearness, and the main roads are shown by colouring. But, considering the care that has been devoted to the general information and improvement of these guides, it is a pity that the ground plans of buildings, where given, have not been improved also and been brought up to date. Plans are given of the cathedrals of Wells, Salisbury, and Bristol. The first-named is the best, but it does not include the discoveries made a few years ago east of the cloister, and it is not provided with a scale. The plan of Bristol Cathedral is provided with a scale, but no difference is made between the old and modern work, and the new position of the altar is not shown. The plan of Salisbury is incomplete, the cloisters and chapter-house and vestry attached to the south-east transept have been omitted, and again there is no scale. Doubtless it may be perhaps said that for the general tourist what is given is sufficient, but when the high standard of these guides in other respects is considered, and considerable revision has been undertaken, the ground plans of interesting buildings when given should be equally well done. It would immensely enhance the value of the works.

Apart from this point, every praise must be given to these books, which are handy in form, clearly printed, and represent a large amount of labour and careful inquiry, and, in spite of the improvement to be noticed in local guides of late years, these handbooks of Mr. Murray, in their well-known red bindings, will have no difficulty in holding their own as the most reliable companion for the tourist.

An Introduction to the Study of Central Station Electricity Supply. By ALBERT GAY, M.I.E.E., and C. H. YEAMAN, A.I.E.E. London: Whittaker & Co. 1899.

THE authors of this work are the head and assistant electrical engineers to the Islington Vestry, and are, therefore, excellently qualified by their everyday work to write on the subject they have chosen. We have deemed it necessary to lay stress on this point, as there is a certain amount of truth in Mr. Swinburne's criticism of recent electrical literature, that the technical works are often written by the wrong people. "A book on electric light should be written by an experienced electric light engineer, not by some one who wants to found a reputation as an engineer on his book on the subject."

In a modestly-written preface the authors claim that their work is "an honest attempt" to place before the reader the elements of central station electricity supply in a concise and convenient form. We think that the attempt has been a successful one, and we can heartily recommend this work to all interested in central station electricity supply. The authors have recognised that the great object of the distribution engineer is to safeguard the continuity of his supply, and no encouragement is given to adopt novel systems, the theory of which is but imperfectly understood. In the earlier chapters a historical *résume* is given of the legislation affecting electricity supply, and the status of companies and municipalities is clearly explained. Advice is then given as to the choice of a system of supply and of a site for the electricity works. Both sides of the various debatable points have been fairly stated, and the reader is left to draw his own conclusions. Although this lack of personal bias detracts a little from the interest of the book, yet we think that it adds to its permanent value. The chapter on price and methods of charging is very readable, and is thoroughly up to date. Descriptions are given of the Baron switch used by the St. Pancras Vestry to enable them to supply electricity to their consumers at two different rates, a cheap rate for daylight supply and a dearer rate for the night service. Wilson's meter switch, which effects the same purpose automatically, is also described. The various scales based on maximum demand are given, and illustrated by means of a diagram. This chapter may be recommended to those who wonder why so many different systems of charging are adopted by various electric light companies.

The chapter on direct systems of supply is one of the most interesting but at the same time one of the most disappointing in the book. The subject is discussed in a thoroughly practical manner, and the explanatory diagrams will be appreciated by electricians who wish to understand the exact working and connexions of the more modern methods. The explanations are, however, in some cases so short that the reader has practically to make up the whole theory for himself from the diagram. For example, we would like to ask the authors many questions about their diagram showing the three-wire system of M. Dobrowolski.

In "Converted Systems of Supply" the authors hardly do justice to the Thomson-Houston compensating system. It is misleading to describe it by saying that "compensators or choking coils were arranged four

in series," &c.; a reader would naturally think that the choking coils were independent of one another, instead of all being wound on the same iron core. We know that this compensator regulates excellently, and we fail to see any resemblance between it and "the use of choking coils in parallel with series alternating arc lamps." On steam generators and plant, switch gear, mains, running and management, &c., their remarks are sensible, and will be a very great help to the youthful electrical engineer. We were struck by their exposure of the fallacy of turning off arc lamps at midnight, and replacing them by two or more glow lamps. The economy sought after could be better effected by simply turning out every second lamp. The small extra expense in power would be more than compensated for by the greater simplicity of the circuits.

The style of the authors is clear but there are a few blemishes in the diction. To talk of "unbalance" for "want of balance" is very inelegant. Again in the earlier part of the book we always read of "buss" bars, but in the later part the authors have thought better of it and always write "bus" bars. We also think it pedantic, as it is certainly old-fashioned, to talk of the action of a transformer or a booster as being "molecular."

There are one or two notable omissions. A little about two-phase and three-phase theory should be added if the book is to be complete. Also at the present time double current generators seem to be coming into fairly general use, and hence they, too, ought to be mentioned. We were surprised to find no discussion of the advantages and disadvantages of earthing the middle wire. Still we are very well content with the work as it is, and can congratulate the authors on their valuable contribution to electrical literature.

Modern Farm Buildings: Their Construction and Arrangement. By A. DUDLEY CLARKE, F.S.I., Land Agent. Third Edition. Revised and Enlarged. London: B. T. Batsford, 94, High Holborn. 1899.

FROM the land agent's point of view there could be no better little book on the subject of farm buildings than this. The author has had a wide experience as a land agent, and knows how to express himself both clearly and concisely. From the house to the piggery every building connected with the farm is passed in review, and the author never forgets that, in the present state of agriculture, economy in every detail must be carefully studied. He is a strong advocate of what we may call the "quadrangle" type of plan; in this the cow-houses and other buildings are arranged around a series of quadrangles or yards, which may be covered wholly or in part with light roofs of wood or galvanised iron. The buildings themselves form the boundaries of the yards, and the cost of fence-walls is therefore saved. Each yard is designed to accommodate eight or ten head of cattle on the basis of 160 superficial feet per head. The walls between the covered yards and the adjacent cow-houses are only 4 ft. 6 in. high, the roof timbers being carried on brick piers about 10 ft. 6 in. apart. It may be thought that this type of plan does not lend itself to thorough ventilation, but experience shows that it is in this respect quite satisfactory; the dwarf walls permit the free movement of vitiated air into the yards, from which it is extracted through a continuous opening between the roofs of the cow-houses, &c., and the eaves of the yard-roofs.

The drainage of the farm-buildings in fig. 1 is unsatisfactory in several respects, but particularly in its lack of ventilation and in the number of gullies in the floors and of drains under the floors. With little or no extra cost surface channels from the buildings could have been arranged (as the author suggests) to discharge over gullies in the yards or roadways, and the drains themselves could have been laid along the yards or roadways instead of under the buildings. The use of unsocketed pipes is also a great mistake, especially in view of the author's recommendation that the well (if other source of water supply is not available) should be sunk in a room alongside one of the yards. In fact, the author has allowed economy to influence him too strongly in respect of both water supply and drainage. Nor does he give due weight to the importance of cleanliness, especially in the sheds for dairy cows; recent investigations have shown that the impurity of milk is very largely due to dirty cow-sheds and dirty cows. The stairs in the farmhouse shown on pages 142-3 have risers 10½ in. high. The most recent "Model Regulations" of the Local Government Board relating to dairies, cow-sheds, and milk-shops are given in an appendix; and a good index concludes the volume.

Although we dissent from some of the author's views, we can heartily recommend his book to all who have to deal with farm-buildings, either as tenants or owners, or as land agents or architects. The fact that it has been adopted by the Council of the Surveyors' Institution as one of the text-books for the Institution's examinations speaks much for its value.

Building Construction for Beginners. By J. W. RILEY. With six hundred and twenty illustrations. London: Macmillan & Co. 1899.

THE "Notes on Building Construction," published by Messrs. Rivington, has long held the field, and deservedly held it. As a pioneer work, supplying in definite shape that help and information which had long been desired, the student must always owe to it his obligations. But it has never been a cheap book. Another book upon the subject, written by Mr. John Parnell Allen, was published some two years since. Yet we are not surprised to find a further work now offered to the public, written by Mr. J. W. Riley, since it is offered at a price which any student may command. In scope this covers the same ground as the first volume of the larger work referred to, and if it does so with some sacrifice of type and margin, it is a concession which cannot reasonably be grudged.

The author claims independence with regard to some of the methods adopted. The diagrams are given in isometric projection. This, as we are told in the preface, will be appreciated by all who know "how difficult it is for the untrained mind to build up a satisfactory mental picture of a solid object from elevations, plans, and sections." We are inclined to think the author right, and agree that plans and sections do, for some beginners, present difficulties that are not immediately recognised by the experienced. We hope that such aids to this mental habit whereby an object is observed in the round, so to speak, may afterwards render impossible that vice in design whereby a plan is completed independently of the elevation, and indeed with no ulterior consideration other than whether the plan will roof. A summary follows each chapter, and following this again are questions selected from recent examination papers of the Science and Art Department. We take it that the arrangement of the book generally is directed towards the assistance of the student whose intention it is to present himself for such examination. The position held by the author as master in one of the large departmental schools should afford him special facilities for offering advice. These candidates, amongst whom there are surely many who must count the cost of the small libraries they may collect, will acquire in "Building Construction for Beginners" a useful addition to their store at a small outlay.

Stable Sanitation and Construction. By T. E. COLEMAN, F.S.I., Surveyor Royal Engineer Civil Staff, &c. With 183 Illustrations. London: E. & F. N. Spon. 1897.

ALTHOUGH nominally a work on stables, this book treats also of cow-houses, piggeries, and kennels. It is really a reprint, with slight alterations, of a series of articles which appeared some time ago in a professional paper, and although it contains much valuable information, we question if the articles were worth publication in their present form. To devote fifty-three pages out of 204 to the subject of ventilation is surely disproportionate. Chapters iii. and iv., which deal chiefly with the theory of ventilation, might well have been omitted or greatly condensed; the matter they contain is mostly padding, and not good padding either. The statement that "for all practical purposes it is found that every right-angle bend within a ventilating flue or shaft reduces the velocity of the current by one-half" is generally accepted as true, but the author's attempted elucidation of it is padding of a very bad sort; he continues, "consequently a current of air having a velocity of 5 ft. per second, on entering a ventilating flue with one right-angle bend, would (irrespective of any loss of velocity due to friction with the sides of the flue) be reduced to 2 ft. 6 in. per second *immediately after passing the bend*,* whilst with two right-angle bends the velocity of the current *after passing the second bend** would only be about 1 ft. 3 in. per second." Perhaps the author can explain what becomes of the air which travels along the first straight length of the shaft at the rate of 5 ft. per second, seeing that *after* the second bend there is a velocity of only 1¼ ft. per second. If between the first and second bends, the area of the shaft were doubled, and if, after the second bend, it were quadrupled, there would be some sense in the passage we have quoted, but nowhere does the author mention such an arrangement, and from the context it is clear that shafts of uniform area are contemplated. On page 35 he bases his general conclusions about ventilation on (among other things) "a difference of level of 35 ft. between the air inlet and outlet," but he does not explain how this difference is to be obtained in a stable of one story. In his illustrations, the difference in level between the outlets and the principal air-inlets is seldom more than 10 ft., and this, according to the table on page 34, gives a velocity of only 2 ft. 9 in. per second, instead of the 5 ft. which he desires to obtain. But the whole subject of ventilation is imperfectly treated. "Natural" ventilation requires careful attention if it is to be successful, and *a priori* reasoning of the kind adopted by the author is of little value. Another serious defect is that the author assumes that horses and cows require essentially the same treatment, whereas not only are they different in nature, but the purposes for which they are kept are also entirely different. In the practical details of stable construction and stable-fitting the author is more at home, and this part of his book can be recommended. The chapters on piggeries and kennels also contain useful information.

Diagrams Exhibiting Discharges and Velocities of Circular and Oval Sewers and Water Conduits. By EDWIN B. NEWTON, F.S.I., A.M.I.C.E. London: The St. Bride's Press.

ALTHOUGH issued in book form, this publication consists practically of three folded diagrams. These are prefaced by explanations as to the formulæ upon which all the calculations are based, and by some brief, but essentially practical, notes on the design of sewerage schemes. The author has something useful to say, and more than this, he resists the temptation of employing a hundred words when ten will suffice. In addition to the recognition of this unusual merit, we may remark that the series of diagrams is likely to be of great service to engineers and others who have to consider matters connected with the flow of water in conduits of various kinds. Like all ready-reckoners, the diagrams must always be used with discrimination, and where extensive or complex systems are under final consideration independent calculations, including allowances for various well-known disturbing elements, should on no account be omitted.

Every Man's Own Lawyer. By a BARRISTER. London: Crosby Lockwood & Son. 1900.

THIS is the thirty-seventh edition of this book. There is no compendium better edited or more carefully kept up to date. The amount of clear and accurate legal information which it gives is almost astonishing. What is surprising is the amount of practical information which is given. Thus, on page 107, we find, "Persons carrying edged tools, bars of iron, or other dangerous things along public thoroughfares must take special care not to injure others, or they or their masters, as the case may be, will be liable in damages to persons injured." This is valuable advice to many engaged in building operations. We give it as an instance of the usefulness of this book.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.—Owing to the impossibility of obtaining in time the necessary information from the architects connected with the various buildings, M. Charles Lucas has not been able to complete his paper on "The Buildings of the Paris Exhibition," which was to have come before the Institute on the 18th inst. The paper is thus unavoidably postponed to a later meeting, and on Monday evening next a paper will be read by Mr. Thomas Blashill on "The Architect in Relation to Fire Prevention."

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* The italics are ours.

Correspondence.

To the Editor of The Builder.

STREET PAVEMENTS IN SALISBURY.

Sir,—Salisbury, with all its recent improvements, is still wanting a good pavement for its streets. Most of the streets have very small and uneven paving stones, and in many places little iron projections stand up to catch the feet of foot passengers, and are very dangerous. It is quite time that something should be done to improve this.

An Inhabitant.

The Student's Column.

ROADS: THEIR CONSTRUCTION AND MAINTENANCE.

Part IV.—Maintenance (*continued*).

25. The Care of Roads.

In the maintenance of macadam roads provision should be made not only for maintaining an even surface, the crucial test of proper management, but also for keeping that surface clean and free from dust and mud. This is necessary both for the purpose of prolonging the wear and also on sanitary grounds. Analysis of road mud reveals the striking fact that a very large proportion consists of animal excrement. Dr. Letheby found that, on a stone-paved road, the average composition of mud is as follows :—

Animal excrement	57
Abraded stone	30
Abraded iron	13
	100

On macadam roads abraded stone forms the greater portion of the superficial detritus. Even if we neglect sanitary consideration and look only at their injurious influence upon the road itself, we shall find that dust and mud are detrimental to wear, acting in a similar manner to the emery on the lapidary's polishing plate. This scouring action is more especially exerted by mud ; but the removal of dust in dry weather is one of the best means of preventing an accumulation of mud in wet seasons. A coating of mud, also, if it is allowed to remain on the road in wet weather, keeps it always soft and damp by preventing evaporation. In this way disintegration by frost is greatly facilitated.

A proof of the influence of mud in promoting wear is to be found in the fact, which experience has firmly established, that the oftener roads are cleansed the less is the mud which is created in the interim, so that, instead of the expense of maintenance being increased by this extra attention, the reverse is the case, the roads being kept in better preservation. As an example of this the following instance may be mentioned. Sir J. Whitworth's street-scraping machine, as employed in Manchester, was shown by calculation to have effected an enormous saving in the wear of the roads and in the quantity of detritus which this wear produced. It has, indeed, been frequently stated that a good cleansing is worth a coat of metal.

There are cases, nevertheless, in which cleansing may be carried too far. It is not desirable, for instance, to remove all the detritus in dry weather from siliceous roads which tend to become loosened by drought, as this would only serve to facilitate still further the natural progress of surface disintegration. In such cases watering will be found a better remedy than sweeping. Water has the effect of binding the surface of gravel or flint roads, but on limestone it has a softening influence, and such a remedy would, therefore, be inadvisable.

With reference to watering roads, a few words may be said on the use of sea water for this purpose. It has been found by some surveyors that an excessive use of salt water is injurious to the road. In long droughts, when the roads are watered several times a day with sea water, a crust of salt is soon formed on the surface. This, owing to its hygroscopic nature, acts as a wet blanket when the air is damp, and causes the surface to disintegrate and come up in patches. The only remedy in this case is a thorough washing of the surface with fresh water. This action appears to be more pronounced in some cases than in others, and is probably influenced to a large extent by the nature of the road stone.

Sweeping and scraping may be performed either by manual labour or by specially constructed machines adapted for horse traction. The latter, however, are seldom used in rural districts, where fallen leaves greatly impede their action. Scraping machines adapted for manual use are also occasionally used ; but, except in the greater rapidity of their action, they are no better than the common hand-scraper, and, moreover, are much more liable to injure the road surface.

The amount of injury which may be done by scraping may be considerably diminished by performing the operation at a suitable time. If the mud is allowed to get too dry, the pressure exerted in scraping it off is liable to loosen the stones near the surface, and to remove not only the mud but also some portion of the road coating as well. There is the same objection to allowing the mud to accumulate until it gets too thick to be easily scraped off. On a road which is in a very soft condition heavy scraping should obviously be avoided. Sometimes such roads are coated with a thick sticky mud which can only be properly moved by the plentiful use of water. In this case water should be used in spite of the softness of the road, as more good than harm will result from the complete cleansing thus effected. Experiment has shown that by this means the quantity of useful grit which is removed with the mud is greatly diminished, and the road is left in a much better condition than before.

The disposal of the mud removed from roads by scraping is often a cause of trouble. The wayside heaps, so often left for long periods, frequently interfere with the drainage and gradually get scattered again by the traffic. If there is no convenient space on which the heaps can be placed beyond the edge of the road, it is better to remove them altogether.

The excessive quantities of mud which form so disagreeable a feature of many country roads in winter may be due to several causes. Of course, the chief source of this mud is the abrasive influence of traffic upon an unsuitable road material. But even if abrasion is not excessive, long-continued neglect may gradually result in the accumulation of thick coatings of mud, especially in the low-lying and flat portions of the road. Another fertile source of mud is the injudicious use of unsuitable binding material in the body of the road. On a badly constructed road, also, with only a thin coat of metal, it is possible that a considerable proportion of mud may work up to the surface from the subsoil. Before any attempt is made to remedy this defect it is advisable to ascertain what is the cause of the mud. A mistake which was frequently made in the older methods of road repairing was to select these muddy places and to cover them up with new metal, instead of first scraping the mud carefully off the surface. If the mud is due to the working up of the subsoil, the road construction is at fault, and the road coating requires strengthening by the careful spreading of new material. In very many cases, however, it is the surface which is at fault. If the road is allowed to remain uneven, water will stand in puddles upon it instead of draining off into the side channels or water tables. The best way to prevent mud, therefore, is to maintain an even surface at all seasons, and to remove the detritus caused by wear, either by sweeping the road in the dry season, or by scraping it as early as possible in the autumn.

This brings us to another most important point in the proper maintenance of macadam roads, viz., atteution to the disposal of surface water. Heavy rainfall always causes a certain amount of wash, which collects in the water tables and gradually chokes them up. On steep gradients the scouring of the surface by rain wash often becomes a serious cause of surface disintegration. The formation of incipient gullies and water channels in a road during heavy rains should, therefore, be carefully watched. If checked at the beginning by providing suitable channels by which the water can escape, much future damage to the road may be avoided. In the autumn, therefore, before the heavy winter rains begin, all water tables should be cleared of silt and weeds, and the easy passage of the surface water assisted by trimming up the road margins and opening out the outlets into the side ditches. The silt from the water tables may be added to the scrapings, and either removed or stored up for use as binding material. The same attention is necessary with regard to the ditches, which require periodical cleaning. If water is allowed to stand high in the ditches it will soon find its way into the substratal portions of the road itself. It is well, therefore, to provide for its speedy removal, making, if necessary, additional drainage channels to carry it away.

In connexion with the cleansing of broken stone roads the great advantages resulting from the use of tar macadam may be here mentioned. The use of tar macadam seems to be growing in favour, and when properly constructed such roads are certainly free from many of the defects experienced with ordinary macadamised surfaces. This is particularly the case as regards their cleanliness. Tar macadam, being quite impervious to moisture, can be swept perfectly clean and even washed without injury. The stones, also, being held more firmly in position by the binding action of the tar, no movement can take place internally, and no mud can be formed except such as is produced by the natural wear of the surface. Repairs, also, are easily done by chipping out the affected parts, refilling with fresh tar macadam, and rolling in with a hand roller. The cost of maintenance of such roads is, therefore, considerably reduced.

An improvement of which many rural roads are sadly in need is the restoration of the surface contour to its proper form. In many cases the injudicious piling of new metal on to the centre of the road, which was the prevalent method of repair indulged in by our forefathers, has resulted in the production of what are known as barrelled roads, the disadvantages of which have already been abundantly illustrated. In other cases the surface has become flattened or even hollow in the centre, and proper surface drainage has been thereby rendered impossible. Hollow roads cannot be economically brought up to the proper contour all at once. To do so would often involve a very thick coating of metal. Where the traffic is light the contour should be restored gradually by spreading a cheaper material in the centre of the road ; and, when it has thus been brought up to the desired slope, a top dressing of harder material may be spread over the whole roadway. When the sides of a hollow road contain more than the required thickness of metal, the form of the road can also be restored by picking off the sides in summer, screening the material, and relaying the coarser stone in the centre. Barrelled roads can also be treated in a similar manner, and the cross section restored, without the addition of any new metal, by picking off the centre and applying the screened material to the lateral portions.

One of the most difficult cases of road distortion is that which is often met with in bog roads. These are liable to get completely out of shape owing to the natural instability of the bog foundation. Sometimes the centre becomes depressed and the sides rise ; at other times the sides get completely cut away. Stability in such cases is not improved even by laying a pitched foundation. The most suitable treatment is a thorough drainage of the road bed by cutting deep longitudinal drains on each side of the road, about 10 ft. back, with frequent transverse drains in the road bed itself ; after which the foundation may be strengthened by sods and fascines. This process, however, involves a complete reconstruction, involving great cost.

The damage done in some localities to macadam roads by gas or water companies, and in the construction or repair of sewers, is often a source of permanent injury to the road. In general, the road surveyor has the power to control such works so far, at least, as to indicate the methods to be adopted in breaking up and restoring the surface ; but, except for extensive works, this control is often not exercised, owing to the difficulty in supervising every small opening which may be made for purely local purposes. In all possible cases, however, it is necessary to see that excavations are only made in the shortest possible sections at one time. Care should be taken to keep the top metal separate from that of the lower portions of the roadway. In filling in the materials should be replaced in their original positions, the surface metal being restored on the top ; and any extra material required to bring the road to its proper shape should be of good stone, and not, as is often the case, of any rubbish that may be available. During the filling the material should be well rammed, and watered if the weather is dry. If the restored portions show signs of sinking or breaking up, those

who undertook the work should be held responsible for repairing the same. It is generally impossible, however, in the case of macadam roads, to get adequate compensation for the amount of permanent damage caused by these openings. The men employed by gas or water companies are often utterly careless of the way in which the trenches are repaired: all the materials excavated are indiscriminately rammed in on tha top of the pipes, leaving a hump of mixed stone and earth which soon wears loose, and never properly consolidates until it is re-excavated to a depth of 6 in., and filled in with good clean metal.

Maintenance of Paved Roads.—The secret of the successful maintenance of paved roads is a careful watching during the first year or two and the immediate rectification of any unevenness which may become noticeable from defective stones, or weak foundations at any points. This is more particularly liable to occur in a brick pavement. Cracked bricks are often the result of a yielding subsoil. It has been noticed that on a clay subsoil even Staffordshire blue bricks often become fractured unless an intervening cushion, 3 in. thick, of ashes is interposed. It has already been shown that in all kinds of block pavement, whether of brick, wood or stone, unevenness means increased wear. For this reason the edges of the blocks are especially liable to become rounded if they are not closely jointed. In the case of bricks, want of uniformity in quality is almost certain to occur, and can often only be brought to light by the way in which the inferior blocks wear under traffic. Any such blocks showing signs of more rapid wear than the rest of the pavement should be at once removed and replaced by others, in order to avoid the injury to the adjacent blocks resulting from the constant collisions brought about by the effects of the inequality. For a similar reason any sinking blocks should be at once rebedded to the proper level. Such sinking ought not to take place if the foundation is properly made; but it is a common defect where concrete foundations are not used. These defects are most likely to occur in the early stages of the pavement, and prompt attention to them will greatly increase both its duration and cost of future maintenance.

Precisely similar treatment is necessary in the case of wood blocks. The life of a wood pavement may be said to depend largely upon the homogeneity of the wood, and consequent freedom from holes due to the decay of isolated blocks. Defective blocks should, therefore, be at once removed, and any unequal settlement should be remedied by rebedding the sunken portions before the neighbouring blocks have become injured by the uneven surface. Experience has shown, also, that wood pavements wear better if sprinkled occasionally with sand or small gravel, which is gradually ground by the traffic into the surface. The effect is most marked on soft woods, into which the small particles of stone are more completely embedded by the pressure of traffic than is the case with hard woods. The advantage of a permanent foundation is seen in the ease with which any worn or defective portions can be removed and relaid with fresh material. When board foundations are used the repairs are often complicated by the necessity of renewing the foundation as well as the blocks; in which case care must be taken to secure a proper bond with the undisturbed part of the foundation.

Blocks, both of wood and stone, when only slightly worn can generally be utilised again in other localities where traffic is lighter. Wood blocks should be recut for this purpose. Old setts should be sorted. Some may be good enough to use again, while others will only be fit for breaking up into macadam.

Before laying new blocks, the old sand cushion must be loosened and fresh sand added where necessary, in order to bed the blocks to the proper level.

Asphalt pavements require the same care and prompt attention to repairs as those of wood or stone. Small breaks are liable to occur in asphalt which, if neglected, rapidly extend. The affected part should be cut away for some distance beyond its area, and the asphalt then stripped off from the foundation, so as to leave a square-cut hole. This hole is then refilled with new asphalt, which soon becomes so thoroughly welded into the old pavement that the patch can scarcely be seen. When many patches are required in a small space, it is better to strip and relay the whole of the affected area at once.

The hydraulic cement base is far more convenient than a bituminous base when repairs become necessary. With the latter stripping becomes difficult, if not impossible, owing to the amalgamation which takes place between the asphalt cover and the support.

Uneven wear in asphalt pavements generally results from want of uniformity in the material, or from want of care in laying it. For this reason, it is usual to require the contractor to keep the pavement in repair for a time at his own cost, and to maintain it for another period at a fixed rate, whereby alone can be secured the exercise of proper care in its construction. Although more readily cleansed than other pavements, asphalt suffers most from the neglect of this attention. The presence of a layer of dirt in damp weather not only increases its slipperiness, but also contributes to its more rapid decay.

With wood pavements cleansing is absolutely necessary on sanitary grounds, owing to the penetration of organic refuse into the substance of the wood, as already explained. One of the advantages claimed for treatment with Carbolineum avenarius instead of ordinary creosote is that it renders cleansing more effectual, since its surface remains moist even in dry weather, and mud or dirt does not adhere.

The breaking up of paved roads for the purpose of laying street mains is even a more serious matter than in the case of macadam. It was estimated that the life of the wood pavement in the Strand was shortened by at least a year on account of injury to the foundations occasioned by the large amount of disturbance produced for this purpose. In repairing such openings, it is advisable to insist upon additional pavement being taken up, so as to expose the concrete foundation for at least a foot all round the excavation. The edges of the foundation should then be bevelled off to a slope of 1 in 3, and the excavation completely cleaned of all loose rubbish before it is refilled with fresh concrete. An interval of a few days is advisable before relaying the pavement to enable the concrete to harden, and traffic should not be permitted over the patch until three or four more days have elapsed.

GENERAL BUILDING NEWS.

ALTERATIONS TO THE GRAND HOTEL, CHARING CROSS.—New rooms were opened on the 6th inst. at the Grand Hotel, Charing Cross. As the boundaries of the hotel cannot be extended, it was necessary to make certain internal alterations. One of them is the construction of a new banqueting-room out of the rooms occupied by Grillion's Club, with certain others added to them. A large room has thus been obtained. Another is the new hall or reception-room, panelled in alabaster and coloured marble. The third is the new reading-room on the ground floor, with an outlook over Charing Cross. Mr. Alfred Waterhouse has been the architect.

BATH ABBEY RESTORATION.—At a meeting of the Executive Committee, held at Bath Guildhall on the 6th inst., Mr. T. G. Jackson, R.A., the architect, was authorised to proceed with such work on the west front and other portions of the fabric as the Committee felt justified in undertaking. It was announced that Mr. John P. Carrington, a native of Bath, had communicated with the architect his desire to do some part of the restoration at his own expense, and he had expressed his willingness to undertake the cost of the carved canopies over the Apostles St. Peter and St. Paul, at the west front. The Committee accepted the gift.

U.P. CHURCH, CAMBUSLANG, LANARK.—A new U.P. church has just been opened at Rossbank, Cambuslang. It is built of red sandstone from Corncockle Quarry, and has side and end galleries, and a recess, behind the pulpit, for the organ. The church will seat about 800 persons. The contractors were: Masonry, Mr. D. Frame, Cambuslang; joinery, Messrs. Jas. Herbertson & Sons, Glasgow; plastering, Mr. R. A. M'Gilvray, West Regent-street; plumbing, Mr. George Rankin, Cambuslang; pendants, &c., Messrs. Buchan & Macintyre; slating, Messrs. A. & D. Mackay; glazing, Mr. Norman Macdougall; ironwork, Messrs. P. & R. Fleming; smith work, Mr. Jas. Mitchell, Cambuslang. The measurers were Messrs. Myers & Brown, and the architect was Mr. Wm. Ferguson, of Glasgow.

BAPTIST CHAPEL, NETHERFIELD, NOTTS.—A new Baptist Chapel at Netherfield was opened on the 30th ult. The building has been erected on a site adjoining the old chapel, which it is now proposed to use as a schoolroom. The principal entrance is from Kenrick-street, the chapel, 55 ft. long and 41 ft. wide, having seating accommodation for about 400 adults. Externally the building is of pressed bricks, with stone dressings. The builder was Mr. John Lewin, of Netherfield; and the internal fittings have been supplied by Mr. George Stimson, of Arnold, Messrs. J. Wright & Son, of Nottingham, and Mr. S. Dove, of Daybrook. The heating apparatus has been put in by Mr. J. Wheeldon, of Basford. The architect was Mr. W. H. Higginbottom, of Nottingham.

CATHOLIC SCHOOLS, BELFAST.—New Catholic schools are being erected in New Lodge-road, Belfast. Mr. J. J. M'Donnell, J.P., is the architect, and Mr. John Fagan the builder.

CHARING CROSS HOSPITAL.—The Lord Mayor presided over a meeting of the Special Appeal Committee in connexion with Charing Cross Hospital, held on the 6th inst., at the Mansion House. It was reported that by an outlay of 18,000*l.* the triangular space on which the institution stands, with the exception of that portion occupied by the Ophthalmic Hospital, was now available for the proposed improvements. The total required for the alterations was 75,000*l.* The Council had 22,000*l.* in hand from the Appeal Fund, so that they must address themselves to the task of raising at least 50,000*l.* more before their good work would be accomplished. Mr. A. Saxon Snell, having secured first place in a limited competition with a set of designs for the new wing, had been appointed architect.

EMPIRE THEATRE, HOLLOWAY.—This theatre, erected from the designs of Mr. W. G. R. Sprague, has just been opened. The building is situated in the Holloway-road, at the corner of Manor-gardens. The approach to the auditorium is from a crush room, marble stairs leading to lounges, communicating with the auditorium, which is about 55 ft. wide, with a depth of about 70 ft. The stage is fitted up with all the latest appliances, its dimensions being about 65 ft. wide, with a depth of about 35 ft., and a height to the grid of over 50 ft. The whole building is lighted by electricity. Gas is supplied as a reserve to all parts. Separating the stage from the auditorium is a double asbestos curtain. Saloons and lounges are arranged for the several sections of the audience. The building has been erected by Mr. Longden, of Neeps End, Sheffield. The interior decorations are by Messrs. De Jong; the furnishings and upholstery by Messrs. Cranston & Elliott; the electric light installations and fittings by Messrs. Slatter; the heating and gas arrangements by Messrs. Vaughan & Brown; hydrants and fireproof curtain by Messrs. Merryweather; and the stage work was by Messrs. Cawdrey. Mr. George Webber has acted as clerk of works.

NEW FIRE STATION, ISLINGTON.—On the 2nd inst. the memorial stone was laid of the new fire-station, Upper-street, Islington. The building, in close proximity to the Upper-street Police-station, will be in red brick with Portland stone dressings. It will consist of four floors, exclusive of basement, and will have a frontage of 48 ft. to Upper-street, with a return northern elevation of about 77 ft. The front of the building will have accommodation for one engineer and seven married men, and the station will be furnished with a steamer, a horse escape, a hose cart, and stabling for four horses, with a basement consisting of stores and workshops. There is also provided lavatory and bath accommodation, &c., for all quarters. A space of about 49 ft. by 50 ft. has been left as an open yard for attending to the engines and the fire apparatus of the station. The ground floor consists of an engine-room, 27 ft. by 40 ft. There is also a watch-room and a recreation-room. That block, with an elevation to Florence-street, will consist of accommodation for four married men and five single men. The whole of the work has been carried out by the Works Department of the County Council, of which Mr. W. Adams is manager. Among those present at the opening ceremony were Mr. Riley, Chief Superintending Architect, and Mr. Pearsall, Assistant Architect.

LIBRARY, DUBLIN.—The new library for the northern district of Dublin, of which William-street is the centre, has now been completed. Portmarnock brick has been used in the construction of the building, the brick being relieved by dressings of artificial stone. The building is situated at the corner of Charleville Mall, near Newcomen Bridge. The accommodation provided in the library is as follows:—A general reading-room, 50 ft. by 28 ft.; a reference library, 28 ft. by 14 ft.; a lending department, 28 ft. by 20 ft.; ladies' reading-room, 20 ft. by 14 ft.; committee-room and book store, 20 ft. by 14 ft. All these rooms are on the ground floor, and they have each a height of 18 ft. to the ceiling. Lavatories, sanitary accommodation, as well as a system of hot-water heating, have been provided all through the building. The contractors were Messrs. Joseph Pemberton & Son, and the work was carried out under the personal supervision of the City Architect, Mr. C. J. M'Carthy.

ADDITIONS TO THE EDINBURGH CITY CHAMBERS.—Edinburgh Town Council a year or two ago sanctioned a scheme for additions to the Edinburgh City Chambers, so as to provide more accommodation for the Corporation and its Committees and officials in the various departments. For many reasons it was agreed that the work should go on in sections. At present a first instalment is on the eve of completion, and the several new rooms will probably be occupied before the year is out. The new building is on the west side of Exchange-square and occupies the site of the old Heriot offices and one or

two ancient houses in Writers'-court. Its frontage to the Exchange, in its architectural features, corresponds with the style of the rest of the square—the plain but dignified Renaissance of the seventeenth century. The chief rooms provided in the new block are a Burgh Court-room on the street level, a banqueting hall above, and, on the top flat, accommodation for the Corporation Museum. Entering from the west end of the piazza is a lobby, 12 ft. in width, panelled in oak to a height of about 10 ft., and with a barrel-vaulted ceiling 18 ft. in height, panelled and richly coffered. A pleasing feature of it is the open oak balustrade of a bridge thrown across it to form a connexion with an entresol floor. On the left is the new Burgh Court-room, in which will also be held the Dean of Guild Court. It is 44 ft. in length, 32 ft. in breadth, and 19 ft. in height. It is panelled in oak to the height of about 13 ft. The ceiling is divided into three compartments by bold beams, supported from the walls by pilasters; the ceiling panels are ornamented, and from the centre of each depends an electrolier. The bench, placed at the north end of the court-room is semi-circular in form, and is built entirely of oak. The back of it shows pilasters with entablature, and a carved frieze behind and over the central chair. There is a dock for prisoners, communicating by means of a trap-door with cells below. The entrance for the public will be by Writers'-court. Opening on this lobby, waiting-rooms for witnesses are provided, and there is also an apartment for the Judge of the day. At the end of the corridor first mentioned is a staircase which gives admission to an entresol flat, to the back, on which rooms for offices are placed. This stair, when the rest of the building to the north is finished, will be reserved as the entrance of the public to the new Council Chamber. Right over the Burgh Court, and corresponding in size to it, is the new banqueting-room, which will dine from fifty to sixty guests. The walls are broken up longitudinally by coupled fluted Ionic pilasters, while at the north end an alcove is formed by throwing out Ionic pilasters with attached columns. The ceiling is divided by coupled beams into three sections, each of which has three secondary panels carved and moulded. From the centre of each panel hangs an electrolier, and there are also electric lights round the walls. There is a mahogany coloured dado round the walls to the height of 3 ft. En suite with this hall is a reception-room for the use of the Town Council or guests. Giving access to these rooms is a main corridor connecting the present Council Chambers with the new additions. It is panelled in walnut and has a groined ceiling, archivolts, and panelled soffits, while the floor is of black and white marble. On the top flat is the museum—a hall stretching right across the new building from east to west, its length being 57 ft., its breadth 53 ft., and its height 23 ft. It is divided down the centre by three piers flanked by Ionic columns. The ceiling consequently takes the form of two arches, the ends of which rest on the central piers and on the east and west walls. The ceiling is further divided longitudinally into four sections, with panelled and coffered arched bands, with ornamental rosettes in every second panel. On the east and west sides there are four large windows filled with stained glass, and above each of them is a clearstory window set in a coved lunette. Adjoining the museum are rooms for the curator. On the floors below the Exchange level, with entrances both from Writers'-court and Warriston-close, are three cells for prisoners, fireproof storage for plans and documents connected with the Burgh and Dean of Guild Courts, and a kitchen department which will be in communication with the banqueting-hall and the new Council Chamber by means of hoists. This new building, designed by Mr. Morham, City Superintendent, will cost about 25,000*l.*—*Scotsman.*

BATHS, POPLAR.—The foundation-stone of the Island Baths, Glengall-road, Millwall, was laid recently. Messrs. Clarkson & Son, of Poplar, are the architects, and Mr. Thorne is the contractor.

PARISH ROOM, ST. MARY'S, COLCHESTER.—A parish room was opened recently in Papillon-road, St. Mary's Parish, Colchester. The building is of red brick faced with Bath stone. The architect was Mr. J. W. Start, and the builder Mr. F. Dupont.

THE KEEP, ROCHESTER CASTLE.—The repair of the fore-building of the ancient Keep of Rochester Castle, which has been carried out under the supervision of Mr. George Payne, Secretary to the Kent Archæological Society, is now completed. The battlements were found to be in a very ruinous state, while the eastern wall of the chapel, the remains of the roof of the chancel, and the chancel arch were also in great need of restoration. The original Norman masonry has been disturbed as little as possible. During the repairs to the roof-line of the nave a fine Norman two-light window was discovered blocked up in the south wall (the north wall of the Keep), and this has been opened by the removal of the plastering. Another interesting discovery was made in the State dungeon, an air-shaft communicating with the lower dungeon being found and opened.—*Standard.*

WESLEYAN CHAPEL, LLANDILO.—The memorial stones were laid recently of a new Welsh Wesleyan Chapel which is being erected in Queen's-road. The structure, which is intended to seat 300 persons, will cost 1,700*l.* The architect is Mr. J. W. Jones, Llandilo; and the builders, Messrs. Thomas Bros., Llandilo.

POOR LAW OFFICES, SWANSEA.—The new Poor Law Offices, which were opened recently at Swansea, are situated in Alexandra-road, at the foot of Clifton Hill. The building is of brick, with Bath stone dressings, and was designed by Mr. H. W. Wills, of Swansea. The contractors were Messrs. Lloyd Bros., and the clerk of works was Mr. Thomas White.

SANITARY AND ENGINEERING NEWS.

ELLAND DRAINAGE.—Mr. W. O. E. Meade-King, M.Inst.C.E., held an inquiry at Elland on December 7, relative to the sanction by the Local Government Board to a loan of 1,000*l.* for moneys expended for sewage purposes in excess of the loan of 13,000*l.* originally sanctioned. The Engineer, Mr. Malcolm Paterson, stated that the entire scheme had been carried out, and explained the cause of the excess, about one-half of which was due to advance in the prices of material and labour. Dr. Wilson, the West Riding Rivers Inspector, stated that the Rivers Board fully recognised the comprehensive method in which the Elland Council had carried out their works of sewerage and sewage treatment, and approved of their dealing with the whole trade refuse of the town at their works, at the same time saying that by more efficient management of the sewage works and a stricter control of the trade effluents admitted to the sewers much better results could be secured. The dry weather flow of Elland sewage is no less than fifty gallons per head per day, nearly two-thirds of which is trade refuse, consisting chiefly of wool-washing and spent dye liquors. Another difficulty is the immense volume of storm-water from the surface of lands which was taken into the old sewers at a time when the treatment of sewage was not contemplated. Mr. Paterson has advised systematic inspection with a view to keep out all such land drainage water.

A LEEDS SEWAGE DISPOSAL PROBLEM.—Apart altogether from the question of the biological treatment of sewage, the Leeds Corporation have in the immediate future a rather difficult problem to face in regard to the general operations at Knostrop. As we have before reported, there are here several lagoons of disagreeable sludge awaiting disposal of some kind. Mud, the effects of the precipitation treatment, covers about one-half of the entire area of the sewage works. There are acres of it, both wet and dry. If additional land were to be had at a reasonable figure, further accommodation might be found for the Leeds sludge on the old lines. As an alternative to that course, an experiment is just now being made, on the suggestion of a Leeds inventor, to consume the superfluous matter by fire, and to do it practically at a profit. By a special process, some of the sludge, after being dried, is amalgamated with a mixture of coal-dust and inflammable oil, about in the proportion of half-and-half, and compressed into fuel of the "briquette" type. The blocks are then consumed along with the coal which is used for heating the boilers at the works, and, so far, the results are said to be satisfactory. Questions of cost and ways and means, it appears, have yet to be thoroughly investigated, but, if all that is claimed for the method be true, the Sewerage Committee may soon be in a position to utilise all their sludge as fuel at no more than the ordinary expense of coal, and thus not only be spared outlay on additional land or projects for removal, but have the valuable space, which is now occupied by the unpleasant material, gradually cleared and rendered available for other purposes.—*Yorkshire Post.*

SEWERAGE, SETTLE, YORKSHIRE.—Colonel A. G. Durnford, R.E., held an inquiry at Settle recently relative to an application to the Local Government Board for sanction to borrow 4,699*l.* for works of sewerage for the townships of Langcliffe, Giggleswick, and Settle. Mr. Broster, engineer, of Keighley, gave details of the new scheme.

PROPOSED BRIDGE OVER THE MERSEY.—It is proposed to promote a Bill in the next session of Parliament for the incorporation of a company to be empowered to construct a bridge across the river Mersey and the Manchester Ship Canal, to connect Widnes and Runcorn. The engineers are Messrs. J. J. Webster, of London, and J. T. Wood, of Liverpool. The estimated cost is about 80,000*l.*

WATER SUPPLY, COALVILLE, LEICESTERSHIRE.—On the 6th inst. Mr. Willcocks, a Local Government Board Inspector, held an inquiry in the Council Chamber, Coalville, into an application by the Urban Council for sanction to borrow 35,000*l.* for purposes of a public water supply. It was explained that the loan wanted now was at first 35,000*l.*, but, owing to the increase in the price of materials, the application had been altered to 35,717*l.*, less 1,858*l.* already received for boring. The scheme includes the construction of a reservoir on land known as High Tor. The engineer is Mr. J. B. Everary.

THE NEW NORTH PIER, LOWESTOFT.—The ceremony of turning the first sod of the new promenade pier at Lowestoft was performed on the 2nd inst. The engineer is Sir Douglas Fox.

STAINED GLASS WINDOWS, NORTH CREAKE CHURCH, NORFOLK—Three stained glass windows have recently been presented to North Creake Church. The work was carried out by Messrs. Bacon Bros

FOREIGN.

FRANCE.—M. Alfred Normand has just been re elected President of the Société Centrale des Architectes Français.——The committee of Old Paris has decided that search shall be made to discover, if possible, the remains of an old Roman theatre, which, from the plans left by the late M. Vequer, second keeper of the Musée Carnavalet, should be found on the site of the Lycée Saint Louis, Boulevard Saint Michel.—The Académie des Beaux-Arts has elected M. Vallaury as *correspondant élranger* in the architectural section. He is an old pupil of the Ecole des Beaux-Arts and Chevalier of the Legion of Honour. At present he is at Constantinople as Architect to the Ottoman Government.——The Municipal Council of Paris has just ordered several statues to complete the decoration of the Sorbonne. In the Cour d'Honneur before the chapel will be two seated statues of Pasteur and Victor Hugo, by MM. Hugues and Marqueste. Two symbolical statues of the "Faculté des Sciences" and the "Faculté des Lettres," by MM. Blanchard and Fagel, will be placed in the hall for the reception of the authorities. In the centre of the enclosure of the Cour d'Honneur will be placed a bronze Minerva by M. Denys Puech. It is probable that the inauguration of the Sorbonne will take place in July, 1900.—— An American lady, Miss Anna Klumpke, who has inherited Rosa Bonheur's fortune, has just given 50,000 francs to the Société des Artists Français, the interest of which will be sufficient to give a prize every year: it will be called the Rosa Bonheur prize.——The death of M. Alfred Richez, architect, Valenciennes, is announced, at the age of fifty-four. From 1875 to 1888 he directed the public works of the town of Roubaix. He was a member of the Société Centrale des Architectes.

UNITED STATES.—It is stated that the "White House" at Washington is to be altered and enlarged in accordance with a scheme prepared by the Superintendent of Public Buildings, under the direction of the President. The scheme, according to the *American Architect*, includes the addition of wings at each end of the present building, retaining the same style, and with the addition also of a new entrance in the middle of one of the wings. This latter feature, according to our American contemporary, will be injurious to the symmetry of the building.——It is intended to build a new bridge to further connect New York and Brooklyn, and also to make a tunnel for the same purpose. The bridge will be a public work, but the tunnel is to be carried out by private enterprise.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENT.—Mr. G. Evelyn T. Laurence, architect, has removed his offices from 181, Queen Victoria-street, to Chandos Chambers, 22, Buckingham-street, Adelphi.

EASTBOURNE MASTER BUILDERS' ASSOCIATION.—On the 7th inst. a meeting of employers in the building and allied trades was held at Eastbourne and attended by master brick-makers, carpenters, decorators, gas and hot-water fitters, masons, plumbers, &c., in addition to builders who undertake all branches. The meeting was convened by the Eastbourne Master Builders' Association. The chair was taken by Mr. Joseph Martin, President of the local Association. Speeches were delivered by Mr. T. F. Rider, President of the South-Eastern Counties' Master Builders' Federation, and Mr. T. Gregory, President of the London Association. A discussion followed, taken part in by Mr. C. Patching, Brighton; Mr. H. E. Cruttenden, St. Leonards; Messrs. Allum, Brock, and Stanbridge, Eastbourne; the Chairman, and others. The suggestion that the formation of a County Association would materially help the combination of employers in the South of England was well received. On the proposition of Mr. Cornwell, seconded by Mr. Stanbridge, a vote of thanks was accorded to Messrs. Rider and Gregory, and with a similar vote to the Chairman, the meeting concluded.

AN EARTHQUAKE-PROOF PALACE.—The Chicago correspondent of the *Morning Post* has communicated the following particulars to that journal:—"Civil engineers are busy here designing a steel-framed palace for the Crown Prince of Japan that is warranted to resist earthquakes. A message was received some time ago from Japan asking whether it was possible to construct a building of sufficient strength and immobility to resist earthquake shocks. Several Chicago engineers drew up plans that would cost $3,000,000 to follow out, and these were submitted and were accepted. Work has been begun on the structure, and it will be shipped to Tokio in sections to be erected there. The palace will be practically constructed entirely of steel like a huge box, so that it cannot fall unless there should be a convulsion of sufficient force to turn it over on one side bodily. When it became known in Japan that the Crown Prince had ordered the earthquake-proof palace several other contracts were given out for similar structures, all of which will be designed in and shipped from Chicago."

A GLADSTONE MEMORIAL BUST, LIVERPOOL.—A memorial bust in marble of the late Mr. Gladstone

was unveiled recently in the Reform Club, Liverpool. The bust was executed by Mr. H. C. Fehr.

INSTITUTE OF SANITARY ENGINEERS (INCORPORATED).—At a meeting of the Election Committee held on Wednesday, the 6th inst., the following were elected, viz.:—Members: A. F. Stilwell, Rochford; A. H. Scott, Southend-on-Sea; W. Strachan, Hemel Hempstead; J. F. Davidson, Wellington Quay; J. Ashton, Ormskirk. Associates: G. F. M. Merriman, Worcester Park; T. M. Taylor, London; J. Holt, Rose Grove; F. G. Edwards, Highbury.

APPOINTMENT OF AN ENGINEER.—At a special meeting of the Birmingham Tame and Rea District Drainage Board on the 5th inst., Mr. J. D. Watson was appointed Engineer to the Board in place of the late Mr. Knight.

ABERDEEN MASTER MASONS' ASSOCIATION.—The annual dinner of this body took place last week under the presidency of Mr. John Fyfe, quarrymaster, Kenmay and Aberdeen. Mr. John Ross, builder, who has for many years been treasurer of the Association, was in the course of the proceedings presented with a purse and 300 sovereigns on the occasion of his retirement from office and business.

MACKAY'S ELECTRIC VENTILATOR.—This contrivance, of which Messrs. Cousland & Mackay, of Glasgow, are the patentees and makers, provides an electric radiator to be placed at the foot of an outlet or extract intended in ordinary circumstances to be actuated by the action of air-currents on a cowl. As we have often pointed out, these cowl extracts are certain to fail exactly when ventilation is most wanted, *i.e.*, when the weather is sultry and the air is still. The patent under notice provides a radiator which, on switching on the electric current, heats the air at the base of the extract and induces an ascending current. It seems likely to be a useful addition where this class of ventilator is used.

VALUE OF BUILDING LAND AT STREATHAM.—As the result of recent arbitration proceedings, Mr. Robert Vigers, past President of the Surveyors' Institution, has awarded the Artizans' and General Dwellings Company, Limited, 5,461*l.* compensation in respect of the acquisition of sixty-five plots of freehold building land, forming a portion of the Leigham Court Estate, Streatham, by the London School Board. The claim was for 9,620*l.*, expert witnesses examined on behalf of the company having valued each of the plots possessing a frontage of 15 ft. at 61*l.*, 390*l.*—twenty-five years' purchase.

THE CARPENTERS' COMPANY.—This Company held their annual examination in sanitary building construction at their hall last week, the number of entries being almost the same as for the last two or three years. The preliminary course of lectures delivered to candidates and others was more numerously attended this year than ever before. The examiners, among whom were Professors T. Roger Smith, Henry Robinson, and Wynter Blyth, and Mr. Jno. Slater, report that the papers showed a marked superiority over the preceding years, as is indicated by the fact that, for the first time, the Company have awarded two gold medals. We give below the list of successful candidates, arranged in order of merit:—

Mr. Alfred Carter	(æq.) Gold medals.
„ A. C. Remnant	(æq.) Gold medals.
„ A. Harrington	(æq.) Silver medals.
„ G. P. Knowles	(æq.) Silver medals.
„ C. B. Burnett	(æq.) Bronze medals.
„ C. W. Denny	(æq.) Bronze medals.
„ W. H. Richardson Jones	(æq.) Bronze medals.
„ A. D. White	(æq.) Bronze medals.
„ C. A. Sales	Certificate.
„ Jas. Greenwood	„
„ Hugh Byron	(æq.) Certificate.
„ W. Sergeant	(æq.) Certificate.
„ H. W. Holley	Certificate.
„ H. Prosser	„
„ Ernest Leney	„
„ Scott Addison	„

LONDON WATER SUPPLY.—The London County Council will apply to Parliament in the ensuing session for leave to bring in two Bills which shall (1) transfer to and vest in them the undertakings of the New River (13 Eliz. c. 18), East London (1853), Southwark and Vauxhall (1852), West Middlesex (1806), Lambeth (1848), Chelsea (1852), Grand Junction (51 Geo. III., c. 169), and Kent (1809) Water Companies, and the Staines Reservoirs Joint Committees established under the Staines Reservoirs Acts of 1896 and 1898; and (2) empower them to provide for securing additional water for the future supply of London within the present statutory limits of supply of the eight water companies. The Council propose to make an impounding and storage reservoir (the Irfon reservoir), in the county of Brecknock, by means of a dam across the river Irfon at a point 28 chains below Gwarafog Bridge, and extending northwards about 65 chains to Llanafanfechan; the reservoir will extend up the river to a point about 18 chains above the bridge of Llanwrtyd Wells, and also for certain distances up the valleys of the Irfon's tributaries. The water would thus be raised to a height of about 12 ft. below the top of the latter bridge's parapet, and of 645 ft. above Ordnance datum, whilst all the land above the dam will be to that extent submerged, and new roads and a bridge will be made. The Bill provides for the construction of other reservoirs by damming of the Towy near Llanwrtyd, the Doethie near Cilycwm, the Upper Wye near Pont Llangurig, and the Chwefri at Llanafan; and for an embanked reservoir at Boreham Wood, Herts, with a top water level of 310 ft. above Ordnance datum. The main aqueduct will pass from the Irfon to Boreham Wood, traversing the parishes of Builth and Hay, Brecknockshire; Cusop, Dorstone, Vowchurch, Killpeck, Hentland, and Ross, Herefordshire; Newent, Hartpury, Maisemore (across the Severn), Churchdown, Badgeworth, Leckhampton, Bourton-on-the-Water, and Great Rissington, Gloucestershire; Ascott, Spelsbury, Barton, Steeple Aston (across the Cherwell), Upper Heyford, Stoke Lyne, and Hethe, Oxfordshire; Tingewick, Padbury, Great Horwood, Stewkeley, Wing, and Ivinghoe, Buckinghamshire; and Tring, Great Gaddesden, Hemel Hempstead Abbots Langley, and Aldenham, Hertfordshire. A branch line of pipes is to be laid from Aldenham to the Midland Railway-bridge at Selvage-lane, Hendon, and another from Boreham Wood reservoir to Elstree. The Council propose to purchase about 500 acres in the two parishes of Tregoyd and Felindre, and Llanigon, including the Tregoyd estate, Brecknockshire, for filtration purposes, together with an aggregate of 273 acres at various places, comprising parts of Mitcheldean (2 acres), Ivinghoe (10 acres), Hudnall (5½ acres), and Bricket Wood (3½ acres) Commons, for the intended works. The costs of the scheme, estimated at 17,000,000*l.*, are to be defrayed (excepting so far as they are otherwise provided for) as payments for general county purposes within the meaning of the Local Government Act, 1888, and the Bill will apply in aid the Sinking Funds held by the Chamberlain of London under certain statutes relating to the New River and other companies who supply water in London. The project differs in some important respects from that promoted by the Council last year, of which the cost was computed at 16,546,000*l.*

THE LONDON COUNTY COUNCIL AND METROPOLITAN IMPROVEMENTS.—The London County Council have given statutory notice of their intention to promote a Bill in the course of next Session for the following purposes:—*Thames Embankment and Improvements in Westminster.*—A river-side embankment and the widening of Abingdon and Millbank streets, in continuation of the present Embankment, between Victoria Tower Gardens and Lambeth Bridge; to widen Horseferry-road (north side) and Wood-street (south side); to widen the roadway on all four sides of Smith-square, and North and Church streets; to lay out new streets from Carpenter-street in Horseferry-road, and Tufton-street into Smith-square opposite the south and west sides respectively, of St. John's Church; and to provide for contributions towards the cost of the works by the United Vestry of St. Margaret and St. John, or by the council of the proposed city or borough of Westminster (London Government Act, 1899). As the "notices" do not deal with fiscal and cognate details, we may state that the Council seek for the powers in question subject to the Government's undertaking to carry out the Abingdon-street portion of the scheme, and to a contribution of not less than 100,000*l.* from the Westminster Vestry. The estimated cost, after recoupment, of embanking the river, laying out the gardens, widening Millbank-street to 70 ft. or 80 ft., and widening and making the other streets up to St. John's Church, with part of Horseferry-road, is 530,000*l.*, whilst the estimated net cost of widening Abingdon-street up to Old Palace Yard is 130,300*l.* The purchase of property will involve an estimated expenditure of 1,329,000*l.*, and the recoupment being valued at 873,000*l.*, the net cost of the Council's scheme amounts to 456,030*l.*, to which should be added about 74,000*l.* for the cost of the works—a total of 530,000*l.* The charge for rehousing on the Millbank site or elsewhere, persons of the labouring class who will be thus dispossessed will, it is anticipated, not exceed 50,000*l.* We understand that the Government approve of the scheme and will undertake the Abingdon-street portion thereof, and that the contribution of 100,000*l.* by the Local Authority for the new area of Westminster will be conditional upon the land between the river and Millbank-street being laid out as a public garden. The Bill will provide for the Government giving up to the public way the strip of land that now appertains to the Victoria Tower garden, the Council finding a substitute for the present stone-yard next, south, to the garden; and it will provide for recovery, by means of an improvement charge, of part of the cost of the improvement. *Mare-street, Hackney.*—To widen to 70 ft. the thoroughfare on either side at several points between the Triangle and the North London Railway, and to widen Morning-lane, together with a new street from the lane to Paragon-street; the total net cost is 577,100*l.*, towards which the Hackney Vestry have offered to contribute 125,000*l.* *Goswell-road.*—To widen the west side of the road to 60 ft. between Upper Ashby and Great Sutton streets, provided the St. Luke and Clerkenwell Vestries will contribute between them a sum of 20,000*l.* towards the computed cost of 209,500*l.* *Nine Elms-lane.*—A widening to 60 ft. partly on the north and partly on the south sides between Battersea Park and Wandsworth roads, the Battersea Vestry to contribute 15,000*l.* to the total net cost—136,400*l.* *Camberwell New-road.*—The south side to be widened between Denmark-hill and Warner-road at a net cost of 52,000*l.*, towards which the Vestry of St. Giles, Camberwell, are required to contribute 5,000*l.* Another improvement consists of a widening of Kentish Town-road, east side, between Patshull-road and Gaisford-street, with the aid of a contribution by St. Pancras Vestry. The computed net cost of the six schemes is 1,565,000*l.*, to be reduced by contributions to 1,297,000*l.*; their accomplishment will involve an annual charge on the rates, for interest on and repayment of debt, calculated on the net cost, of 57,665*l.*, equivalent to a rate of ·374d. in the pound. The Bill also provides for the widening, at various places, of several other streets, comprising High-street and Gardener's-lane, Putney; Lewisham High-road, Eltham-road, and Lee High-road; Blackheath and Shooter's-hill roads; Battersea-rise and West Hill, Wandsworth; Streatham High-road; Archway and Blackstock roads, in Islington parish; and St. John-street-road, Clerkenwell, west side, between Albemarle and Aylesbury streets; and for an extension of Maclise-road (east end) into Hammersmith-road at Portland-Place. The foregoing projects involve the stopping-up of a large number of streets, courts, passages, and other places, amongst them being Goswell-place; Jerusalem square and passage, Hackney; and Millbank, Grub, Romney (in part) and Little Tufton streets, York-buildings, and Scott's-rents, Westminster.

NEW SITES FOR SCHOOLS, LONDON.—The London School Board have framed their annual schedule of sites to be acquired for providing additional public elementary school accommodation. The number of sites is forty-three (two of them, however, being alternative), representing an aggregate area of almost thirty-five acres, there being ten sites of 9,680 square yards apiece. A comparison, in respect of the locality and the number of sites, with previous schedules, whereof abstracts have appeared in our columns, shows that the fresh schools are spreading to the confines of the London district, and corroborates a fact which is commonly overlooked when the overcrowding of London is discussed—namely, that the rate of increase of population in London has been diminishing for several years past. The writer of a letter published in the *Times* last week gives statistics to demonstrate that the population within the "central area" has diminished at a progressive rate since 1861, the rates of diminution for the successive decades being 2·7, 4·6, and 7·2 per cent. The new sites which the School Board propose to take are distributed as follows:—Kensington.—Nos. 1 to 6, with their gardens and forecourts, St. Mark's Grove; and a plot in Edinburgh-road. Fulham.—In Townmead-road; Nos. 1-4, Gordon cottages, William-street; and in Woodlawn-road. Hammersmith (four, two being alternative). Nos. 1-3, Goodwin-road; Nos. 11-12, Saunders-road; and either Nos. 142-4-6, Uxbridge-road (Bulwer-street), or eight houses, Nos. 70-84, Uxbridge-road (Sterne-street). Chelsea.—Six houses in Marlborough-road and Keppel-street. Islington.—The Elms, Hilldrop-road; and No. 4, Trinity-street. Deptford.—Land at the junction of Vesta and Shardeloes roads. Lee.—Land in Manor-lane. Lewisham.—Lands in Stillness, Hazelbank, and Ladywell roads. Plumstead.—No. 107, Conway-road. Eltham.—Land adjoining their Pope-street school. Shoreditch.—No. 2, Gopsall-street. Bethnal Green.—Four houses and gardens in Lyte-street, and eleven in Morpeth-street. Hackney.—No. 9, Bradstock-road; the Albion Hall and Baths, Albion-square; and a house, No. 101, and land in Mandeville-street. Camberwell.—Nos. 73-89 (odd) and adjoining messuages, Camberwell-grove. Battersea.—Land in Broomwood-road; and premises, with paddock, in Wix's-lane. Clapham.—Land on the Hyde Farm Estate. Streatham.—Three parcels of land in Greyhound-lane, Mitcham-lane, and Hereward-road. Lambeth.—No. 72, Santley-street. St. Pancras.—No. 9, Cathcart-street; land abutting on their school in Camden-street; and the school, house, yards, &c., fronting Fortess-road and Raveley-street. Hampstead.—Nos. 12-16, John-street, and part of the garden of Heath cottage. St. George, Southwark.—All the seven houses of Minor-place, with ten houses in King James-street. St. George-in-the-East.—Seventeen houses, yards, &c., in Cowley-street; and lands in Globe and High streets, Wapping. Mile End New Town.—Nos. 159-61, Hanbury-street. Bromley St. Leonard.—Thirteen houses in Knapp-road. Poplar.—Four houses in Pekin and Swale streets.

ELECTRIC LIGHTING WORKS, SHEFFIELD.—Colonel W. Langton Coke recently held a Local Government Board inquiry at the Town Hall, Sheffield, into an application of the Corporation for sanction to borrow 100,000*l.* for the purposes of the municipal electric lighting undertaking. Mr. W. Johnson, the manager of the Electric Light Department of the Corporation, explained the purposes for which the money is intended.

LEGAL.

AN ELECTRICAL ENGINEER'S UNFORTUNATE CONTRACT.

LORDS JUSTICES A. L. SMITH, COLLINS, AND VAUGHAN WILLIAMS, in the Court of Appeal on the 7th inst., delivered judgment in the case of Steg-

mann *v.* O'Connor, on the appeal of the plaintiff from the judgment of a Divisional Court of Queen's Bench, composed of Justices Bruce and Ridley, upholding the decision of the Official Referee. The only question raised by the appeal was whether the defendant was entitled to the sum of 50*l.* which the Official Referee had given him on his counter-claim as being a penalty or liquidated damages provided for by the contract. The facts were, shortly, these. The plaintiff was an electrical engineer, and in April, 1898, he entered into a contract with the defendant, the owner of a house at Clapham, to erect an installation of electric lighting and to put up the fittings to be supplied by the defendant for the sum of 76*l.* 10s., the work to be done to the satisfaction of the defendant's architect. The contract also provided that plaintiff should pay 5*l.* a day by way of liquidated damages for every day's delay if the work was not completed within the time specified by the contract. When the work was done, the defendant's architect refused to pass it and called in another firm of electrical engineers to do the work. The Official Referee found that the plaintiff had not done the work according to contract and the specifications and that another electrician had to be called in to do the work. He found that the material used by the defendant, and which belonged to the plaintiff, amounted to 2*l.* 16s., and allowed the plaintiff 9*l.* 3s. for extra work which he did, making together 11*l.* 19s. The Official Referee then awarded the defendant, by way of liquidated damages, 50*l.*, and after deducting the 11*l.* 19s. which he had given the plaintiff, he gave his certificate in favour of the defendant for 38*l.* 1s. It was a term of the contract that the plaintiff should put in "Silvertown" wire, and this it was admitted he had not done. Another cause of complaint was that plaintiff had put the wires in the lead tubing tight instead of putting them in loose. When the plaintiff went to the defendant's house for the purpose of substituting "Silvertown" wire for that put in he was refused access to the premises. On behalf of the plaintiff it was contended that defendant could not claim the 50*l.* awarded on the counterclaim as he himself had put an end to the contract; and said that the 5*l.* a day provided for by the contract was clearly a penalty and not liquidated damages. He further said that, on the construction of the contract, the penalty could not begin to run until the whole of the contract was completed. The defendant could not claim the penalty when he put an end to the contract himself. On behalf of the defendant it was contended that the judgment of the Official Referee and Divisional Court should not be disturbed. If it be true that a man had to wait until a contractor completed his contract before he could sue for penalties, he might never be in a position to sue, as the contractor might refuse to complete it. It was contended that such a construction of the contract would be unreasonable.

In the result the Court by a majority (Lord Justice Vaughan Williams dissenting) dismissed the appeal, with costs.

Mr. Tindal Atkinson appeared for the appellant (plaintiff), and Mr. Clavell Salter for the respondent (defendant).

PROPER USE OF THE CRANE:

BUILDER'S LABOURER GETS COMPENSATION.

BEFORE Judge Stonor and a jury, on Monday, at Brompton County Court, a builder's labourer, George Crabb, Pimlico, London, W., sought to recover, under the Employers' Liability Act, the sum of 50*l.* from his late employers, George Smith & Co., Limited, builders, and owners of saw mills, Commercial-road, Pimlico; the amount claimed being for personal injuries sustained—it was said—through negligence on the part of the defendants' foreman.

Mr. W. M. Thompson was counsel for the plaintiff, and Mr. Matthews, counsel, defended.

The plaintiff's case, shortly, was as follows:—He had been in the service of the defendant company for about two years, and when making full time, his wages came to 1*l.* 8s. 3d. a week. On October 2 last he, with three other men, was taking down some balks of pitch pine from a stack on to the ground, where they were being turned over and inspected. The balks of timber in question were 16 in. by 8 in., and 28 ft. or more in length, weighing half a ton and upwards. According to the general custom, the men moved this heavy timber by means of a travelling crane. The foreman, however, came and complained of their taking too much time in attaching the iron "dogs" to the timber and unattaching the same, and told them to pull down the balks and turn them over by hand. They managed very well for a time, but one rather wet balk, in being turned, slipped against plaintiff, "pinning" him down on the stack. With great difficulty some twenty men managed to move the balk and release him.

The Judge: You move the light balks by hand, I suppose?

The Plaintiff: Yes, sir; but anything over 5 cwt. should be moved by means of the traveller.

Cross-examined: The balks in question had been squared by the saw, and the iron "dogs" would make nasty holes in the timber. The reason he did not complain about having to move the balks by hand was that the foreman was a man whom those under him dare scarcely speak to, or even look at. The plaintiff added that, owing to there having been some eight accidents within nine weeks at the same works, the defendants had engaged a doctor of their own.

The House Surgeon at St. George's Hospital had attended the man, and said that the right arm was badly fractured just above the wrist. In his opinion it would be some two months more before plaintiff could resume his ordinary work.

Men engaged in the building trade were called, and gave it as their opinion that to move by hand balks of timber like the one in question would be dangerous, and not in accordance with the custom of the trade.

For the defence, William Harry Hancock, the foreman referred to above, stated that he ordered the men to turn over the timber by hand, because that would be the quicker way of doing the work, and it was necessary to be quick, as the gentleman inspecting the timber had to catch a train. It was not at all unusual to move such balks by hand; in fact, many firms had no travelling cranes. He had been in the trade for twenty years, and considered there was nothing dangerous in moving such timber by hand. The plaintiff, however, let his arm get beneath the balk "as he ought not to have done."

Cross-examined: The men resorted to the use of the traveller after the accident in question, and he "did not object," nor did he "order them to do so."

Mr. James William Turner, managing director of the defendant company, said he had often seen heavy weights, like the piece of timber referred to, moved by hand, and did not consider it dangerous. The use of iron "dogs" was likely to spoil a piece of timber, for, as a rule, only about $\frac{3}{16}$ in. would be taken off the surface by planing.

Walter Baylis, employed at a builder and timber merchant's yard in Kentish Town, said that his experience went to show that balks of timber like the one described were often moved without the assistance of a crane. Only when a balk weighed more than half a ton was it usual to move it by means of a crane. He considered that it was quite as safe to move large pieces of timber by hand as by means of a crane.

Joseph Pilling, under-foreman on the defendants' works, said that he had assisted in moving hundreds of balks, similar to the one in question, by hand. If, however, he were taking the timber off a van he would use the traveller.

His Honour said it was for the jury to consider the one question: Was the defendants' foreman guilty of negligence in ordering the men to move the balks of timber by hand?

The jury answered the question in the affirmative, and assessed the damages in the plaintiff's favour at the amount claimed, namely, 50*l.*

His Honour gave judgment accordingly, and allowed costs.

MEETINGS.

FRIDAY, DECEMBER 15.

Architectural Association. — Mr. Andrew Oliver on "Streets and Buildings of Old London." 7.30 p.m.

Institution of Civil Engineers (*Students' Meeting*).—Mr. Blamey Stevens on "Sludge." 8 p.m.

SATURDAY, DECEMBER 16.

Sanitary Inspectors' Association. — Mr. E. Lewis Thomas, M.A., LL.D., on "The Foods and Drugs Act, 1899." 6 p.m.

British Institute of Certified Carpenters. — Annual Meeting at Carpenters' Hall, at 6 p.m.

Dundee Institute of Architecture. —Visit to Caird Hospital and Royal Bank Buildings. 2 p.m.

MONDAY, DECEMBER 18.

Royal Institute of British Architects. — Mr. Thomas Blashill on "The Architect in Relation to Fire Prevention." 8 p.m.

Leeds and Yorkshire Architectural Society. — Mr. R. Wood on "Modern Building Construction in Chicago." 6.30 p.m.

Liverpool Architectural Society.—Mr. G. W. Fraser on "Windows and their Treatment." 6 p.m.

TUESDAY, DECEMBER 19.

Architectural Association of Ireland.—Mr. R. Caulfeild Orpen on "Modern Domestic Interiors." 8 p.m.

Institution of Civil Engineers.—(1) Paper to be further discussed: "Combined Refuse Destructors and Power Plants," by Mr. C. Newton Russell. (2, time permitting) Mr. R. A. Tatton on "The Purification of Water After its Use in Manufactories," and Mr. W. O. E. Meade-King on "Experiments on the Purification of Waste Water from Factories." 8 p.m.

WEDNESDAY, DECEMBER 20.

Society of Arts.—Mr. H. Bloomfield Bare on "Bi-Manual Training by Blackboard Drawing." Mr. Walter Crane will preside. 8 p.m.

Builders' Foremen and Clerks of Works' Institution.—Annual meeting of the directors. 7 p.m.

THURSDAY, DECEMBER 21.

Institution of Civil Engineers.—Students' Visit to the generating station of the Westminster Electricity Corporation, and subsequently to the works of the Shingleton Ice Company, Eccleston-place, S.W. Assemble at the Generating Station, Eccleston-place, at 2 p.m.

FRIDAY, DECEMBER 22.

Glasgow Architectural Craftsmen's Society.—Mr. Isaac Low on "Water-closets and their Connexions." 8 p.m.

SATURDAY, DECEMBER 23.

Dundee Institute of Architecture.—Mr. Charles Soutar on "Some Local Cathedrals." 7 p.m.

PRICES CURRENT OF MATERIALS:

WOOD.*

Per Petersburg standard hundred.

	£ s. d.	£ s. d.
White Sea: first yellow deals	18 0 0	21 10 0
Second do.	16 0 0	18 0 0
Third do.	13 10 0	15 0 0
Battens, 40s., 30s., and 15s. less respectively.		
Petersburg: first yellow deals	15 0 0	17 10 0
Second do.	12 0 0	13 10 0
Battens, 30s. and 20s. less respectively.		
Petersburg, white deals	10 10 0	12 10 0
Do. white battens	9 0 0	10 0 0
Riga, white deals	9 10 0	10 10 0
Swedish mixed yellow deals	16 0 0	18 0 0
Third do.	14 0 0	16 0 0
Fourth do.	12 0 0	13 0 0
Fifth do.	11 0 0	12 0 0
Battens, 30s., 20s., and 10s. less respectively.		
Whitewood, 10 to 20 per cent. less.		
Finnish unsorted yellow deals	11 0 0	11 10 0
Battens, 10s. and 5s. less respectively.		
Whitewood, 5 to 10 per cent. less.		
Norwegian second yellow battens	8 0 0	8 10 0
Third do.	7 15 0	8 0 0
Fourth do.	7 10 0	7 15 0
Whitewood, 10s. less.		
Danzig, Crown Deck deals, per 40 ft. 3 in.	0 15 0	1 5 0
Brack	0 12 0	1 0 0
St. Lawrence Pine deals, &c., per P.S.H.:—		
1st, Bright and Dry, regular sizes	20 0 0	27 0 0
" " oddments	13 0 0	20 0 0
2nd " regular sizes	15 0 0	17 10 0
" " oddments	10 0 0	14 0 0
3rd " regular sizes	9 0 0	11 0 0
" " oddments	7 10 0	9 10 0
4th " regular sizes	8 0 0	9 0 0
" " oddments	7 0 0	8 10 0
St. Lawrence Spruce deals, &c.		
First, regular sizes	9 10 0	12 10 0
Second "	9 0 0	9 10 0
Third "	8 15 0	9 0 0
Fourth "	8 0 0	8 10 0
Oddments and battens at 20s., 10s., 7s. 6d., and 5s. less respectively.		
New Brunswick Spruce deals, &c.	8 10 0	9 0 0
Oddments, battens, and fourths	8 0 0	8 10 0
United States pitch pine planks and boards	10 0 0	13 0 0
Prepared Boards, per square		
1½ by 6½ and 7 in. 1st yellow	10 0	15 0
" " 2nd "	9 6	12 0
1 by 6½ and 7 in. 1st "	9 6	11 0
" " " white	8 0	9 6
" " 2nd yellow	8 0	10 0
" " " white	7 0	8 0
⅞ by 6½ & 7 in. 1st & 2nd yellow	7 9	9 0
" " " white	7 6	8 6
¾ by 6½ and 7 in. 1st yellow and white (grooved, tongued, and beaded)	8 0	9 6
¾ by 6½ and 7 in. 2nd yellow and white (ditto)	7 6	8 6
⅝ by 6½ and 7 in. 1st yellow and white (ditto)	6 6	7 6
⅝ by 6½ and 7 in. 2nd yellow and white (ditto)	6 0	7 0
Narrower widths at 10 per cent. less.		
3rd quality at 15 per cent. less than 2nd.		
Danzig and Memel Fir Timber— per load		
Best middling	3 15 0	4 0 0
Good middling and Second	3 5 0	3 10 0
Common middling	3 0 0	3 5 0
Undersized	3 0 0	3 5 0
Swedish and Norwegian Balks	2 10 0	2 15 0
Baltic Oak Timber—		
Danzig and Stettin—Large	3 5 0	4 5 0
Small	2 10 0	3 5 0
Quebec Timber per load		
Yellow Pine	4 15 0	6 5 0
Oak	4 12 6	6 15 0
Elm	4 2 6	4 7 6
Ash	3 7 6	4 2 6
Birch	3 7 6	5 15 0
New Brunswick, &c., Birch	3 2 6	3 12 6
American Pitch Pine Timber	3 17 6	4 10 0
Wainscot, per log, 18 cubic ft.—		
Crown (Eng. & Dutch) } nominal	3 7 6	4 10 0
Brack } nominal	2 12 6	3 12 6
Lathwood, per cubic fathom—		
Petersburg	4 0 0	6 10 0
Riga and Danzig	4 10 0	5 10 0
Norway Poles, per ft. run	0 0 1	0 0 1½
Oak Staves, per mille full size pipe		
Memel, Crown	220 0 0	230 0 0
Brack	190 0 0	200 0 0
Danzig	165 0 0	175 0 0
Bosnia, single Barrel (nominal)	28 0 0	30 0 0
United States, Pipe	37 10 0	45 0 0
Hogshead, extra heavy and double extra	30 0 0	35 0 0
Indian Teake per load	11 10 0	17 0 0
British Guiana Greenheart	0 0 0	8 0 0
Mahogany, per foot superficial—		
Honduras, cargo average	0 0 5	0 0 6½
Nicaragua, do.	0 0 4½	0 0 5½
Tabasco, do.	0 0 4½	0 0 6½
Mexican, do.	0 0 4	0 0 4½
Panama, do.	0 0 3	0 0 4
African, do.	0 0 3½	0 0 5½
Cuba, do.	0 0 6	0 0 8
St. Domingo, do.	0 0 5	0 0 7½
Do. Curls (good to prime)	0 0 9	0 1 3
Walnut, American (logs)	0 2 3	0 4 6
Do. do. (planks and boards)	0 2 0	0 7 6
Italian, per foot superficial	0 0 3	0 0 7½
Black Sea, per ton	6 0 0	12 0 0

* The prices named are for the wood as imported and landed in the docks. Ten per cent., approximately, should be added in order to arrive at the current trade prices.

PRICES CURRENT—*continued.*

	£	s.	d.	£	s.	d.
Satin Walnut (logs) per foot cube..	0	1	0	0	1	3
,, (planks and boards)	0	2	0	0	2	9
Sequoia (Californian redwood), per foot cube	0	1	9	0	2	0
Whitewood, American .....(logs)	0	1	3	0	1	6
,, ,, (planks and boards)..	0	1	6	0	2	9
Quartered oak ,, ,, ..	0	2	3	0	4	0
Kauri pine.....(logs)	0	1	9	0	2	0
,, ,, ...(planks)	0	2	3	0	2	9
Jarrah .....(planks)	0	2	0	0	2	3
Lancewood spars each, fresh and large	0	5	0	0	8	0
Lancewood spars, ordinary to fair..	0	4	0	0	5	0
Degame spars.....	0	8	0	0	10	0

METALS.

IRON—Pig, in Scotland ..... ton	3	7	6	0	0	0
Bar, Welsh, in London	9	0	0	9	15	0
Do. do. at works in Wales.....	8	10	0	9	0	0
Do. Staffordshire, in London....	9	15	0	11	15	0
COPPER—British cake and ingot ..	76	15	0	77	10	0
Best selected	73	5	0	79	15	0
Sheets, strong.....	83	0	0	84	0	0
Chili bars.....	72	7	6	0	0	0
YELLOW METAL .....lb.	6¾d.			7d.		
LEAD—Pig						
Spanish .....ton	17	15	0	0	0	0
English Com. Brands	18	0	0	0	0	0
Sheet, English, 6 lbs. per sq. ft. and upwards	19	5	0	0	0	0
Pipe	19	15	0	0	0	0
ZINC—English sheet .....ton	26	0	0	0	0	0
Vieille Montagne	27	0	0	0	0	0
Spelter	20	5	0	20	10	0
TIN—Straits	108	0	0	0	0	0
Australian	108	10	0	109	0	0
English Ingots	112	0	0	113	0	0
Banca	0	0	0	0	0	0
Billiton	0	0	0	0	0	0

OILS.

Linseed .....ton	21	12	6	0	0	0
Cocoanut, Cochin	29	15	0	0	0	0
Do. Ceylon	26	15	0	0	0	0
Palm, Lagos	27	10	0	0	0	0
Rapeseed, English, pale	24	10	0	0	0	0
Do. Brown	23	0	0	0	0	0
Cottonseed ref.	19	10	0	20	0	0
Oleine	17	5	0	19	5	0
Lubricating U.S.	0	8	0	0	0	0
Do. Black	0	7	6	0	0	0
TAR—Stockholm.....barrel	1	6	6	0	0	0
Archangel.....	1	0	0	0	0	0
Turpentine	36	17	6	37	0	0

RECENT PATENTS:

ACCEPTED SPECIFICATIONS.

Open to Opposition until February 6.

[1898] 22,520, Desrumaux, Purifying Water and other Liquids. 22,790, Gibbons, Locks and Keys. 24,788-9, McDonald, Lavatories, and Two-piece Closets. 25,155, James, Artificial Marble, Granite, &c.: see also [1899] 20,518. 25,203, J. Duckett & Son, and Duckett, Top-flushed Slop Water-closets. 25,297, Bucher, [1899] 2,392, Schneeweiss; 4,223, Berger; and 17,343, Dauber, Generators for Acetylene Gas. 25,335, Scotland, Means for Heating Dwellings, Halls, &c. 25,548, Ruble, Adams, & Iorns, Apparatus for Withdrawing Shavings, Dust, &c., and for Ventilation. 26,106, Howat, Putting Together and Taking to Pieces Miners' Safety Lamps. 26,488, Wilson, Incandescent Gas Burners. 26,678, Thomson & Smith, Friction Clutches. 26,736, Challis, Composition for Removing Soot and Scale from Chimneys, Flues, &c. 27,261, Horvarth, Calculating Apparatus. 27,269, Kunkelmann, François, & Loubery, Electricity Measuring Apparatus. 27,334-6, Nye, Receivers, Transmitters, and Exchanges for Telephones. [1899] 224, Tonge, Tonge, & Eaves, Hydraulic Presses and Pumps for Mining Purposes. 635, Franzen, Electrical Appliances for the Control of Gas Supply, and its Ignition, from a Distance. 666, Mackenzie, Street Lamps. 962, Crudgington, and 1,921, Webster, Electrical Arc Lamps. 1,664, Boisselier & Laurent, Bricks, Slabs, Blocks, Flagstones, &c. 1,756, Davies & Earle, Drying Apparatus for Portland Cement and for Similar Purposes. 1,760, Hudd & Kemp, Smoke Cowls. 1,792, Rodgers, Domestic Fire Grates. 1,828, Wilkes, Wilkes, & Goodman, Cases or Bodies for Locks, &c. 1,982, Wethered, Locks and Latches. 1,984, Garland, Adjustable Canopies of Stove Grates. 1,998, Hillman, Method of Jointing Metal Tubes. 2,013, Mathewson, Sand Blast Apparatus. 2,103, Worthington, Taps and Cocks. 2,128, Robinson, Making Bricks, Tiles, &c. 2,668, Manchee, Wire Fence Droppers. 4,333, Russell, Mechanism for Running Curtains upon Poles. 6,367, Price & Gough, Means for Fastening the Doors of Safes and Strong Rooms. 15,566, Trueman, Clutches and Brakes. 15,585, Schoeller, Permatation Lock. 16,266, Gottsch & Fehrs, Hanging Stages or Scaffoldings. 16,275, Adshead, Centre Portion of Metallic Curbs and Fenders. 17,339, S. des Verreries de Bruxelles, Process for the Total or Partial Hardening of Glass. 17,344, Knüttel, Covers for Castings. 17,507, Allgemeine Elektricitats G., Electrical Lamps with Illuminating Bodies made of Second-class Conductors. 18,129, Hirt, Water Purifying Apparatus. 18,750, Voelker and Others, Burners for Gas-Lighting by Incandescence. 18,938, Ehrenbacher, Device for Regulating the Heights of the Wick in Spirit, Petroleum, and Paraffin Lamps. 18,968, Sinding-Larsen, Electrical Incandescent Lamps. 19,898, Baldwin, Setting and External Flues of Steam Boilers. 19,973, Whitehead, Harris, & Sacré, Cowls to Prevent Down-Draught, Rain, &c., in Chimneys and Ventilators. 20,100, Railing & Collings, Suspension Fittings for Electrical Lighting Systems Adapted to a High Voltage. 20,121, Kappenberger, Insulators for Electrical Wires. 20,162, Antiseptic Appliance Co., Antiseptic Appliance for Sound Transmitter Mouth-Pieces. 20,518, Weill, Artificial Marble. 20,773, Mühlenthal, Löwenthal, & Hahn, Pressure and Supply Regulator for Gases and Other Liquids. 20,807, Meehan & Gray, Air and Gas Valves for Furnaces. 20,883, Von der Höh, Door and Other Locks. 20,949, Borsdorf, Adjustable Metal Fittings for Earthenware. 21,017, Piepmeyer & Karst, Heating Buildings, &c. 21,084, Mandt, Magnetically Operated Locks suitable for Safety Lamps or Other Purposes. 21,250, Read, Incandescent Oil Lamps. 21,411, Bright, Fire Extinguishers. 21,413, Sacks, Safety Fuses for Electrical Circuits. 21,452, Gathmann, Sterilising Water and Other Liquids. 21,558, Skaruppe, Gas Ignition at the Burners. 21,563, Heum, Fire Escapes. 21,641, Rodda, Device for Use with Drawing Pencils, &c. 21,659, Johnston, Circuit Breakers for Alternating Currents. 21,683, Novotny & Mierisch, Scouring and Cleaning Pipes and Conduits. 21,746, Greger, Manhole Frames and Covers. 21,940, Sugden, Feed Water Purifiers and Heaters for Steam Generators.

ABSTRACTS OF PATENTED INVENTIONS.

17,448.—SOLDERING IRONS: *E. R. Tiburtius.*—The bent gas supply-pipe forms the handle into which is screwed a Bunsen burner, to which is fixed a copper bit; the flame passes, through apertures, over the bit, and the pipe has a foot upon which it may be laid with the burner turned upwards.

17,449.—ACETYLENE: *T. Manger.*—Upon the cock of the supply-pipe is pivotted another pipe, which is weighted at one end in order that its other end may bear against an arm that projects from the bell of the gas-holder; the cock is closed and opened with the rise and the fall of the bell, so as to control a supply of the water which passes from out of a funnel into the generator; when the generator is exhausted and the bell has fallen accordingly, a chain on the pivotted pipe turns a cock, and so diverts water into the generator, the gas passes through a washing chamber, and so to the holder.

17,459.—HOLDERS FOR BRICKS, TILES, &C.: *G. P. Edwards* (*George Phœnix*).—The contrivance for lifting bricks and tiles in the course of building consists of a skeleton box or frame, which is made up of metal strips bent into a squared form and fastened with rivets, one side being hinged for filling purposes. When filled the box is closed by pushing a hinged and slotted flap over the lugs, and the lifting hook is adjusted in its place. The lap can be lengthened so as to pass across the box and to engage with an upright in the frame's side.

17,497.—TREATMENT OF WOOD, FABRIC, &C.: *G. X. Dime.*—A fireproofing composition is made of chloride of ammonia, 15 parts, and microcosmic salt, 1 part, and the wood, when thoroughly dried, is immersed in a hot solution of the mixture. In the case of celluloid, the composition is mixed with the material itself.

17,523.—FLUID METERS: *M. Otto.*—On passing through a cylinder whose area, in cross section, is ascertained, the fluid turns a fan geared to a counter, and so proportioned that the indicator gives quantitative readings for zero temperature and 760 mm. pressure, whilst the hundreds wheel at each revolution moves a style to impress a dot upon the cylinder as it revolves uniformly. A Bourdon pressure-gauge and a bi-metallic thermometer move styles for tracing records of pressure and temperature and furnish corresponding corrections.

17,538.—AUTOMATICAL SPRINKLERS: *H. Beech.*—A fusible prop is devised for supporting the valve of a sprinkler. It is composed of a T-piece, which has a horizontal knife-edge and a limb hanging downwards within a U-piece, which rests upon a point that forms a part of the valve nozzle. The vertical limb's lower end is clamped to a tongue upon the U-piece by means of a band, which is soldered to a rod larger than the opening between the U-piece's two arms, and the sprinkler's valve rests the knife-edge. The prop falls when the solder becomes fused, and the valve falls too. Various modifications of the principle are described in the specification.

17,580.—INCANDESCENT LAMPS: *C. A. von Welsbach.*—Filaments of osmium (see Nos. 1,535 and 13,116 of 1898) are made of admixtures that contain oxides which can be volatilised from out of the filaments at a white heat, and will at the same time carry off impurities; the admixture consists of osmium—ten parts, and titanium oxide—four parts, by weight, finely divided, though alumina, lime, or magnesia may be substituted, with the addition of an organic binding material; the filaments, ejected through a die and rendered smooth by being rolled between glass plates wrapped in paper, are then shaped, dried, and slowly heated in a reducing atmosphere, the oxide is thus volatilised, and the elastic filaments assume a uniform density.

17,586.—MANHOLES: *J. Jones.*—A cover for the manholes of telephonical cables, &c., is intended for ventilation and escape of moisture; the lid, which is recessed for cement filling, rests upon a gutter and a rabbet, a drainage-tube extending from the former, and also upon studs of lead or other metal, formed in either the lid or the frame. Ventilation holes are cut in an inner arched cover.

17,615.—CIRCULAR SAW GUARD: *T. Duncan.*—Upon one arm of an angled bracket is clamped a frame so that it can be adjusted sideways, and the guard is clamped in a slot in the arm bracket's vertical arm, the bracket is clamped upon another which is fixed to the saw fence, and on the guard a cleaving knife is mounted.

17,622.—INCANDESCENT LAMPS: *J. T. Lister and W. S. Chamberlain.*—The lamp is constructed that it may have a seal at its neck-end by means of two tubes at one end of each of which is an outward flange; the leading-in wires, fixed by fusion of the surrounding glass, are placed within recesses made in the larger tubes end, and the wires are composed of both copper and platinum, being joined together at the sealing in the glass, if more filaments than one are employed the terminals are joined inside or outside the glass; the smaller tube's flange is then attached to that of the larger tube and the flange of the latter is secured to the bulb's open neck; exhaustion is then effected through the larger tube and the seal is completed.

17,657.—VALVES AND COUPLINGS: *N. H. Medberry, B. T. Potter, & C. A. Potter.*—The couplings have two or more conduits which may be connected at one and the same time; for two conduits, set at a right angle, the couplings are fashioned with ducts, that coincide with holes in the valves when the coupling is made, and with grooves into which pass inclined projections upon the valves that enter screw threads and fasten the joint when a partial rotation is effected. Pins upon the couplings engage with projections upon the valves and move the latter to open the conduits—the same principle is adopted for the coupling of four conduits.

17,660.—FASTENING FOR DOORS AND WINDOWS: *C. Kotru.*—The door or window can be retained partly open, or closed, by means of a sliding bolt shot by a rack and pinion to be turned with a thumb-bit or key, notches in the bolt engage in a spring and so secure the bolt in any position; when the bolt-head is partly shot, it engages with a pivotted and slotted bar, whereby the door will be held partly open, but the closed door is locked as the bolt-head, fully shot, enters the staple.

17,733.—MANHOLES AND VENTILATORS FOR DRAINS: *J. Knight.*—A manhole chamber, made of artificial stone slabs, consists of an upper and a lower compartment. surface drainage flows into the latter through a gulley, a separate receiver being provided for the silt, and a similar gulley passes waste from sinks, baths, and so on; a block having a central open channel and side branches forms a bottom for the lower division, into which the ventilating and soil pipes enter; for deep draining a metal domed roof is attached to the compartment and a shaft communicates with the surface.

17,787.—BENCHES FOR WOOD-WORKING: *A. L. Dunbar.*—The bench, which is primarily intended for use by joinery classes, has damp-proof receptacles for tools, and is fitted with vices, stops, and rests, the students working in pairs and facing one another.

17,814.—COLLAPSIBLE DRESSING-BOXES FOR BATHS, SCHOOLS, &C.: *E. J. Wakeling.*—The inventor devises compartments that may be folded up so as to form a panelled wood dado; their sides are pivotted on to uprights on the wall and are held in position by bolts; the two doors of two adjoining boxes are pivotted at each side that one may be folded over the other; folding shelves, seats, and clothes-hooks are provided.

17,822.—HAND-PUMPS FOR EXTINGUISHING FIRE: *L. de L. Wells.*—Around the pump, which is placed centrically, more or less, in the reservoir, is fitted a collapsible suction reservoir held up by ribs; to the lower end of the casing in which the pump is fixed is fastened a stirrup for holding it down, and the hose is attached to the upper end: thus the pump can be worked, and the jet directed, by one man.

17,853.—BRICKS FOR HOT-BLAST STOVES: *J. L. Stevenson & J. Evans.*—The bricks for the checquer work of hot-blast stoves are made in the form of two equal and symmetrical crosses joined together, to be built up horizontally in layers that break joint with those immediately above or below them; the bricks are made in various shapes, and the edges of the shanks, or cross-arms, may be chamfered.

17,887.—AIR AND WATER HEATERS: *J. T. Spencer.*—Waste heat of gas, oil, and other burners or stoves is utilised for heating air for rooms, or water for baths, and similar purposes; in the case of an air-heating contrivance as applied to an illuminating gas burner a frame and a globe are mounted over the jet, whilst resting upon the frame, or hanging from a hook above the burner, is a heating chamber which has a dome-shaped cover and a bottom with a central aperture and tubes that reach from top to bottom; for a "geyser" to be used with oil lamps, or with gas or oil burners, the chamber is contained within a casing which stands upon foot-rests, the heated water rises in the pipes and after being discharged on the cover is drawn away from a ringed trough underneath.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

November 25.—By WRIGHT & SCRUBY (at Cambridge).	
Harston, Cambs.—A freehold and copyhold farm, area 151 a. 0 r. 32 p.	£4,550
Landbeach, Cambs.—A freehold close, 6 a. 0 r. 4 p.	145
Waterbeach, Cambs.—Red Hill Farm, 15 a. 3 r. 15 p., f.	665
Two closes, 13 a. 1 r. 38 p., f.	195
November 27.—By STEPHENSON & ALEXANDER (at Cardiff).	
Cardiff, Glamorgan.—45 and 47, Partridge-rd., u.t. 65 yrs., g.r. 7*l.* 8s.	810
November 28.—By W. J. GARDNER (at Masons' Hall Tavern).	
Willesden Green.—High-rd., "The Case is Altered" p.-h., u.t. 74½ yrs., r. 85*l.*, with goodwill	17,100
December 1.—By HUGH SWORDER (at Epping).	
Netteswell, Essex.—A freehold house, cottage, and 10 a. 1 r. 20 p.	650
An enclosure of arable, 4 a. 0 r. 11 p., f.	205
December 2.—By W. DEW & SON (at Holyhead).	
Holyhead, Anglesey.—Gareglwyd, and 2 a. 2 r. 16 p., f.	1,000
High-rd., &c., enclosures of land, 11 a. 0 r. 7 p., f.	1,845
Llanfwrog, Anglesey.—Peniel Fawr Farm, 28 a. 3 r. 33 p., f.	900
Llanrhuddlad, Anglesey.—Aelwyd Uchaf Holding, 7 a. 2 r., f.	200
Cefn du Bach Holding, 48 a. 3 r. 11 p., f.....	1,200
December 4.—By JOHN BOTT & SONS.	
Herne Hill.—Gubyon-av., Glanville, u.t. 85 yrs., g.r. 11*l.* 10s., r. 70*l.*	740
By CHANCELLOR & SONS,	
Sydenham.—9, High-st., f., r. 70*l.*	1,190
December 5.—By DEBENHAM, TEWSON, & CO.	
Shortlands, Kent.—Scott's-lane, f.g.r. 42*l.*, reversion in 77 yrs.	1,200
Shortlands-grove, f.g.r.'s 61*l.*, reversion in 81 yrs.	1,620
Hyde Park.—124, Gloucester-ter., u.t. 40 yrs., g.r. 30*l.*, r. 120*l.*	1,410
Forest Hill.—5, Wynell-rd., u.t. 63 yrs., g.r. 6*l.*, e.r. 40*l.*	230
By BRODIE, TIMBS, & CO.	
Strand.—12, Houghton-st., f., r. 42*l.*	1,020
Brentford, Middlesex.—3, 5, 7, and 9, Market-pl., f.	590
Heston, Middlesex.—Cranford-lane, "The Rising Sun" p.-h. and 19 cottages, u.t. 40 yrs., g.r. 21*l.*	1,410
By J. H. LYNCH.	
Willesden.—13, Lennox Villas, u.t. 75 yrs., g.r. 7*l.* 10s., r. 30*l.*	310
By NOTLEY & CO.	
Clapham Common.—7, Nightingale-lane, f.	2,050
Marylebone.—5, Boston-st., u.t. 9¾ yrs., g.r. 4*l.*, also a concurrent policy for 200*l.*, payable in 1900.....	150
By GEO. PEARCE & SONS.	
Hoxton.—15, Felton-st., f.....	370
28, Shaftesbury-st., u.t. 33 yrs., g.r. 14*l.*.. r. 35*l.*	190
Stoke Newington.—17, Watson-st., u.t. 63 yrs., g.r. 5*l.* 10s.	190
By WESTON & SONS.	
Brixton.—69, Treherne-rd., u.t. 64 yrs., g.r. 5*l.* 10s., r. 32*l.*	335
Battersea.—33, Winstanley-rd., u.t. 65 yrs., g.r. 7*l.*, r. 45*l.*.....	400
Peckham.—92, Hill-st., f., r. 28*l.*.....	520
Camden-rd.—15, Sandall-rd., u.t. 61 yrs., g.r. 6*l.*, r. 42*l.*	460
12, Clifton-rd., u.t. 54 yrs., g.r. 7*l.* 4s., r. 50*l.*..	460

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered.
*Erection of Hospital	Doncaster R.D.C.	25*l.* and 15*l.*	Feb. 28
*Erection of General Hospital	Glasgow Parish Council	200*l.*; 150*l.*; 100*l.* and 50*l.*	No date

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c. Supplied by	Tenders to be delivered.
Shops, Coal Stage, &c. Wortley Junction	Lancs. & Yorks. Ry. Co.	R. C. Irwin, Hunt's Bank, Manchester	Dec. 19
Bridge Works, Stanley-street, &c Blackburn	do.	do	do.
Cast Iron Pipes, Hamilton, N.B.	Lanark Dist. Comte.	J. & A. Leslie & Reid, C.E. 72A, George-street, Edinburgh	do.
Stoneware Pipes, &c.	King's Lynn Corp.	H. J. Weaver, Boro. Engr. King's Lynn	do.
Building Works, Dearham (Cumberland)		J. Russell, School Board Offices, Dearham	do.
Station, Blaen Llynvi, Glam.	G. W. Ry. Co.	G. K. Mills, Paddington Station, W.	do.
Stables, Frome Station	do.	do.	do.
Steel Bridge Girders, &c. (230 tons)	do.	do.	do.
Goods Shed, &c. Thornhill, Yorks.	Lancs. & Yorks. Ry. Co.	W. B. Worthington, Engr. Hunt's Bank, Manchester	do.
Chapel, Austwick, Yorks.		J. Ledingham, Archt. District Bank Chmbrs. Bradford	do.
Sewerage Works	Cromer U.D.C.	A. F. Scott, Surv. Church-st. Cromer	Dec. 20
Additions, Cwmavon, Wales		Thomas & James, Archt. Port Talbot	do.
Street Works, Queen's-road, &c.	Felixstowe & Walton U.D.C.	G. S. Horton, Surv. Town Hall, Felixstowe	do.
*Additions to Vestry Hall	Chiswick U.D.C.	A. Ramsden, Vestry Hall, Chiswick	do.
*Street Improvement Works	do.	do.	do.
*Fittings for Two Chapels	Parish of St. Pancras	A. & C. Harston, 15, Leadenhall-st. E.C.	Dec. 21
Additions to House, Westdown, Ilfracombe	M. Chugg	A. T. Hussell, Archt. Market-sq. Ilfracombe	do.
Cottage, Ilchester Wharf	Birkenhead Corp.	T. O. Paterson, C.E. Thomas-st. Birkenhead	do.
School, Stanleytown, Glam.	Ystradyfodwg Sch. Bd.	Jacob Rees, Archt. Hillside Cottage, Pentre	do.
Cemetery Works, Portknockie, N.B	Rathven P.C.	J. Alcock, Surv. Keith	do.
*Erection of Power Station		O. P. Parsons, 14, Temple-st. Birmingham	do
*Central Fire Station, &c. &c.	Borough of Bootle	Anderson & Crawford, 38, Dale-st. Liverpool	Dec. 22
Additions, &c. to Hydro	Ben Rhydding Hydro. Co.	Isitt, Adkin, & Hill, Archt. Prudential Bldgs. Bradford	do.
House and Stable, Ovenden, Yorks.		Jackson & Fox, Archt. 7, Rawson-st. Halifax	Dec. 23
Rebuilding Junction Inn, Eastrick, Yorks.	Halifax Brewery Co.	W. C. Williams, Archt. 29, Southgate, Halifax	do.
House at Waterworks	Gainsborough U.D.C.	P. Griffith, 54, Parliament-st. Westminster	do.
Additions to Workhouse	Cardiff Union	E. Seward, Archt. Queen's Chambers, Cardiff	do.
Sewerage Works, Sonning	Wokingham R.D.C.	J. F. Sargeant, Council Offices	do.

CONTRACTS—*Continued.*

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c. Supplied by	Tenders to be delivered.
Schools	Barry (Glam.) Sch. Bd.	Geo. Thomas, Archt. Queen's Chmbrs. Cardiff	Dec. 23
Pair of Villas, Stafford-rd. Halifax		R. Horsfall & Son, Archt. 22A, Commercial-street, Halifax	do.
Broken Granite, Quartzite, &c.	Sussex C.C.	W. B. Purser, C.E. 31, Bedford-road, Horsham	Dec. 25
Enlargement of Station, Glasgow	Glasgow and South Western Ry. Co.	F. H. Gidlies, St. Enoch Station, Glasgow	do.
Hospital, Braemar	Deeside District Com	Jenkins & Marr, C.E. 16, Bridge-st. Aberdeen	Dec. 27
Offices and Centre	Newcastle-on-Tyne Sch. Bd.	W. H. Knowles, Archt. 37 Grainger-st. Newcastle	Dec. 30
Building Works, Fencing, &c.	Donington (Lincs.) P.C.	A. G. Fletcher, Council Offices, Donington	do.
Granite or Basalt Road Metal (1,200 tons)	Hastings Corp.	P. H. Palmer, C.E. Town Hall	Jan. 1
*Construction of Reservoir	Llanelly U.D.C.	J. H. Barres, 30, G. George-st. Westminster	Jan. 2
*Execution of Certain Works	Metropolitan Asylums Bd.	Metropolitan Asylums Bd. Norfolk House, Norfolk-st. Strand	Jan. 3
*Erection of Public Library	Vestry of St. John, Hampstead	The Clerk, Vestry Hall, Haverstock Hill, N.W.	Jan. 4
Offices, Fire Station, &c. Whitley (Northumberland)	Whitley & Monkseaton U.D.C.	J. P. Spencer, 13, Grainger-st. West, Newcastle	Jan. 5
Additions to Workhouse	Birmingham Union	W. H. Ward, Archt. Paradise-st. Birmingham	Jan. 6
*Erection of Post and Inland Revenue Offices	H.M. Office of Works	Post Master, Preston	Jan. 10
*New Electricity Generating Station	Cnty. Boro. of Birkenhead	C. Brownridge, Town Hall, Birkenhead	Jan. 16
*Erection of Baths and Washhouses	St. Pancras Vestry	T. W. Aldwinckle 1, Victoria-st. S.W.	Jan. 26
Three Houses, Chesham-st. Bradford		R. Drake, Archt. 142, Allerton-road, Allerton, Bradford	No date
Bakery and Stables, Rawtenstall, Lanca.	Hartley & Co.	F. J. Hobson, Archt. King-st. Rawtenstall	do.
Stable and Shed, Brockholes, Huddersfield		F. Buckley, Industrial Soc. Brockholes	do.
Slaughter Houses, Arbroath, N.B.		H. Gavin, Archt. Arbroath	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in.
*Clerk of Works	Chesterfield Sch. Bd.	3*l.* per week	Dec. 21
*Clerk of Works	Wolverhampton Union	350*l.* per annum	Dec. 27
*Building Inspector	City of Bristol	120*l.* per annum rising to 150*l.*	Dec. 28
*Building Inspector	Walthamstow U.D.C.	2*l.* 15*s.* per week	Dec. 29
*District Surveyor & Junior Assistant	Sheffield Corp.	230*l.* per annum and 80*l.* per annum	do.
*Assistant Engineer	City of Liverpool	300*l.* per annum	Dec. 30
*Sewers' Foreman	Newington Vestry	2*l.* per week	Jan. 1
*Architect	Walthamstow Sch. Bd.	300*l.* per annum	Jan. 5
District Surveyor	East Sussex C.C.	160*l.* per annum	Jan. 9
*Accountant and Cashier	In connexion with Engineering Works at Old Calabar, Niger Protectorate	35*l.* per calendar month	No date

Those marked with an asterisk (*) are advertised in this Number. *Competitions, p.* iv. *Contracts, pp.* iv. vi. viii. x. & xxi. *Public Appointments, pp.* xix. & xxi.

Regent's Park.—45 and 46, Cumberland Market, u.t. 25 yrs., g.r. 15*l.* £750

By HEPPER & SONS (at Leeds).

Leeds.—Saville Green, the Saville Green Brewery, area 950 yds., f. 900
Saville Green, Saville Green House, f. 465
16, 18, and 20, Pott-st., and 17, 19, and 21, Pott-row, f. 500
39, Freehold-st., f. 370

By FLEURET, SON, & ADAMS (at Masons' Hall Tavern).

Southwark.—Borough High-st., "The Half Moon Hotel," u.t. 17½ yrs., r. 190*l.* 4s., with goodwill 2,500

By ALFRED RICHARDS (at Tottenham).

Stamford Hill.—1 and 6, Henrietta-rd., u.t. 70 yrs., g.r. 13*l.* 350
Tottenham.—66 and 68, King's-rd., f. 540
40, Church-rd., f. 240
50 to 57, Love-lane, f. 1,165
1 to 6, Vine-cottages, f. 810
Orchard-place, Rose Cottage, f. 170
1, Prospect-place, f. 250
3 to 8, 29, 30, 39, and 40, Nursery-st., u.t. 66½ yrs., g.r. 27*l.* 1,150
121 and 123, Clyde-rd., u.t. 56 yrs., g.r. 2*l.* 10*s.* 305
Enfield.—Montague-rd., Montague House, with two blocks of land, f. 490

By STOKES & PINDER (at Kennington).

Kennington.—101, Farmers-rd., u.t. 51 yrs., g.r. 6*l.*, r. 36*l.* 555

December 6.—By BUNCH & DUKE.

Fulham.—6 and 8, Moore Park-rd., u.t. 57 yrs., g.r. nil, r. 74*l.* 810
Hackney.—18, 20, and 22, Casterton-st., u.t. 77½ yrs., g.r. 15*l.* 10*s.* 640

By FULLER & FULLER.

Knightsbridge.—10 and 11, Charles-st., u.t. 20½ yrs., g.r. 14*l.*, r. 125*l.* 1,055

By PERCIVAL HODSON.

Camden Town.—5 to 10, Prebend-st., u.t. 22 yrs., g.r. 15*l.* 12*s.*, r. 192*l.* 18*s.* 1,010
16, 18 to 22, Randolph-rd., u.t. 22 yrs., g.r. 13*l.*, r. 235*l.* 12*s.* 1,125
69 to 99, 113 to 121 (odd), King's-rd., u.t. 22 yrs., g.r. 38*l.* 19*s.*, r. 817*l.* 8*s.* (in lots) 4,460
12, Canal-ter., u.t. 22 yrs., g.r. 3*l.* 10*s.*, r. 28*l.* .. 140
Hornsey.—Brampton Park-rd., f.g.r. 27*l.*, reversion in 80 yrs. 660
Notting Hill.—Holland Park-av., i.g.r.'s 180*l.*, u.t. 22½ yrs., g.r. 60*l.*, with reversion 1,330
Regent's Park.—Redhill-st., &c., i.g.r. 40*l.*, u.t. 23¾ yrs., g.r. 8*l.* 275
Camden Town.—Prebend-st., i.g.r.'s 25*l.* 17*s.*, u.t. 22 yrs., g.r. nil 285

By ALFRED PREECE (at Finsbury Park).

Hornsey.—26 and 28, St. Mary's-rd., u.t. 61 yrs., g.r. 16*l.* £220
42, Lausanne-rd., u.t. 69 yrs., g.r. 5*l.*, r. 30*l.* 350
59, Park Ridings, u.t. 69 yrs., g.r. 5*l.*, r. 28*l.* .. 265

By NOCK & JOSELAND (at Wolverhampton).

Upper Penn, &c., Staffs.—The Penn Hall Estates, 388 a. 0 r. 25 p., f. (in numerous lots) 31,680

December 7.—By ALLAN BOOTH.

St. Luke's.—8 and 9, Roscoe-st., u.t. 28 yrs., g.r. 84*l.* 10*s.*, e.r. 321*l.* 3,150
Holloway.—Camden-rd., the Brecknock Nurseries, r. 55*l.*; also i.g.r. 7*l.*, u.t. 46 yrs., g.r. 17*l.* 1,525

By W. HALLETT & CO.

Acton.—1 and 2, Leamington Park-villas, u.t. 68 yrs., g.r. 13*l.*, e.r. 70*l.* 530

By G. B. SMALLPEICE.

Stratford.—45, Martin-st., u.t. 57½ yrs., g.r. 6*l.*, r. 26*l.* 160
224 to 230 (even), 242, 244, 246, 270, 272, 282, and 284, High-st., u.t. 64 yrs., g.r. 126*l.* r. 405*l.* (in lots) 2,855

By STIMSON & SONS.

Vauxhall.—6 to 18 (even), Durham-st., area nearly 14,000 ft., c., r. 217*l.* 4,300
Putney.—120 and 122, Upper Richmond-rd., f., e.r. 140*l.*, with goodwill 2,225
Clapton.—25 and 27, Inver-rd., u.t. 79 yrs., g.r. 11*l.* 10*s.* 440
Peckham.—37, Radnor-st., u.t. 40 yrs., g.r. 4*l.* 4*s.*, r. 24*l.* 260
Manor Park.—2 to 12 (even), Ruskin-av., f. 1,600
Old Kent-rd.—No. 367, u.t. 24 yrs., g.r. 11*l.*, r. 50*l.* 280
Forest Hill.—Montem-rd., a plot of building land, f. 125
Brixton.—177, Loughborough-rd., u.t. 11 yrs., g.r. 10*l.*, e.r. 65*l.* 260

By NEWBON, EDWARDS, & SHEPHARD.

Hackney.—1, 3, and 3a, Tower-st., area 6,700 ft., f., r. 127*l.* 1,870
5 to 17 (odd), and 15a, Tower-st., area 16,100 ft., f., r. 318*l.* 6*s.* 5,380
192, 192a, and 192b, Mare-st., f., r. 255*l.* 3,000
95, Hackney-rd., u.t. 21 yrs., g.r. 35*l.*, r. 88*l.* .. 300
111, Hackney-rd., and 4, 5, and 6, John-st., u.t. 21 yrs., g.r. 47*l.* 530
Clapton.—5, 7, and 9, Mayola-rd., u.t. 79 yrs., g.r. 18*l.*, r. 90*l.* 970
Dalston.—33, Albert-rd., f., r. 34*l.* 600
Clerkenwell.—41 and 42, Clerkenwell Green, f., r. 90*l.* 1,520
9 to 13, Howard's-pl., u.t. 30 yrs., g.r. 10*l.* 1,230
Notting Hill.—Cornwall-rd., i.g.r. 9*l.*, u.t. 53 yrs., g.r. 3*l.* 115
Mile End.—Ernest-st., &c., i.g.r. 21*l.*, u.t. 18 yrs., g.r. 6*l.* 6*s.* £125
Peckham.—13, 14, and 15, Pitt-st., u.t. 14 yrs., g.r. 9*l.* 9*s.* 240
Caledonian-rd.—No. 100, u.t. 35 yrs., g.r. 10*l.*, r. 60*l.* 605

By WINDRUM & CLEAVE.

Poplar.—44, 46, and 48, Kerbey-st., and two cottages in rear, f. 855
Clapton.—229, Brooke-rd., u.t. 78 yrs., g.r. 10*l.*, e.r. 45*l.* 385
Stratford.—67, West Ham-lane, u.t. 94 yrs., g.r. 8*l.*, r. 60*l.* 720
Hackney.—11, Grove-passage, u.t. 23 yrs., g.r. 35*l.*, r. 67*l.* 220
Walthamstow.—46, Northcote-rd., u.t. 77 yrs., g.r. 5*l.* 15*s.* 150
Stratford.—12A, 12 to 18 (even), Edith-rd., f. 470

December 8.—By G. ERNEST CLARKE.

Walthamstow.—61 to 66, Hawkesley-rd., f. 1,300

By P. J. DIXON & SON.

Ilford.—Romford-rd., f.g.r.'s 217*l.* 9*s.*, reversion in 996 yrs. 6,300
Bethnal Green.—182 and 184, Green-st., and 37 and 39, Moss-st., f. 2,050
Mile End.—76, Globe-rd., f. 500
Victoria Pk.—93, Cadogan-ter., f. 450

By P. & G. GEEN.

Croydon.—17, 19, 23 to 31 (odd), Queen's-rd., u.t. 87 yrs., g.r. 31*l.* 10*s.*, r. 210*l.* 1,300
Wimbledon.—Astonville-st., f.g.r. 12*l.*, reversion in 94 yrs. 275
Brixton.—14, St. Saviour's-rd., u.t. 58 yrs., g.r. 12*l.*, e.r. 70*l.* 720

By CHARLES CANEY.

Camberwell.—7, 8, and 9, Wilson-rd., u.t. 55½ yrs., g.r. 18*l.*, r. 119*l.* 1,290

By FOSTER & CRANFIELD.

Clapton.—28, 30, and 32, Downs-rd., f., r. 145*l.* .. 2,240
Maida Hill.—8, Clarendon-gardens, u.t. 49 yrs., g.r. 4*l.*, r. 50*l.* 445
12, Clifton-villas, u.t. 42 yrs., g.r. 10*l.*, e.r. 80*l.* 660
Balls Pond.—38, 39, and 40, Canterbury-rd., u.t. 52 yrs., g.r. 11*l.* 5*s.*, r. 86*l.* 950
Clapham.—64, Manor-st. (with off-license), u.t. 9 yrs., g.r. 5*l.* 9*s.*, r. 40*l.* 150
5, 7, and 9, Nelson-row, u.t. 11 yrs., g.r. 9*l.* 155
Penge.—4, 6, 8, and 10, Oakfield-rd., f., r. 122*l.* .. 760

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.

TO CORRESPONDENTS.

O. T.—M. H. (Amounts should have been stated).

NOTE.—The responsibility of signed articles, letters, and papers read at public meetings, rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays.* N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under £100, unless in some exceptional cases and for special reasons.]

* Denotes *accepted.* † Denotes *provisionally accepted.*

ABERDARE.—For the erection of eleven houses, for the Trustees of Mount Pleasant Building Club, Cwmaman, Aberdare. Mr. J. Llewellin Smith, architect, Aberdare:—

	Per House.
Morgan & Sons	£270
W. E. Willis*	220

ABERDARE.—For the erection of house, Hirwain-road, Aberdare, for Mr. W. Thomas. Mr. J. Llewellin Smith, architect, Aberdare:—

D. Davies	£268 11 0	Evan Jones*	£231 13 6

ABERDARE.—For alterations and additions to 69, Bute-street, Aberdare, for Mr. W. Thomas. Mr. J. Llewellin Smith, architect, Aberdare:—

J. D. Wilkins	£148 4	John Jones	£127 15
Michael Thomas	143 0	D. Davies*	107 0

ALRESFORD (Hants).—For the erection of vagrant wards, laundry, &c., at the workhouse, for the Union Guardians. Mr. W. H. Hunt, architect, Alresford. Quantities by Mr. E. R. Babbs, Hook, Surbiton:—

Mussellwhite & Son	£1,484 0 0	Boscomb	£1,098 0 0
Tucker	1,267 0 0	Eddotts, Alresford*	1,076 17 6

BARRY (Glam.).—For the erection of hospital and appurtenant buildings, &c., for the Urban District Council. Mr. J. C. Pardoe, C.E., Council Offices, Barry:—

G. Rutter	£9,102 9 0	Davies & Profit	£8,275 0 0
D. Davies	9,022 0 0	Richards & Evans	7,972 0 0
Lattey & Co.	8,978 0 0	Jones Bros.	7,960 0 0
W. Brillon	8,550 0 0	J. Prout	7,940 0 0
Lloyd & Tape	8,318 0 0	A. Richards	7,915 0 0
Evans Bros.	8,300 18 4		

[Whole matter deferred.]

BEXLEY (Kent).—For the erection of school buildings for the School Board. Mr. J. Ladds, architect, 7, Doughty-street, Mecklenburgh-square, London, W.C. Quantities by Mr. Alfred Boxall, 8, Adam-street, Adelphi, W.C.:—

T. D. Graty	£5,880	Garlick & Crutchfield	£5,539
Martin, Wells & Co.	5,789	T. G. Sharpington	5,439
Pryer & Co.	5,613	J. Lonsdale, Swanley Junction‡	5,227
Thomas & Edge	5,556		
West Bros.	5,552		

‡ Accepted subject to approval of the Education Department.

CWMAMAN.—For alterations and additions to 30 and 31, Fforchaman-road, Cwmaman, for Dr. R. F. Thomas. Mr. Llewellin Smith, architect, Aberdare:—

W. E. Willis	£300 0	J. D. Wilkins*	£226 11
D. Condon	240 0		

HARWICH.—For levelling, paving, &c., Stour-street St. Nicholas, for the Town Council. Mr. Henry Ditcham, Borough Surveyor, 7, West-street, Harwich:—

Horan & Son	£1,318	Smith & Son, Witham*	£1,250
H. J. Stone	1,300		

[Surveyor's estimate, £1,186 3 4.]

LONDON.—For the erection of staff home, laundry, workshops, &c., at the infirmary, Fulham-road, West Brompton, for the Guardians of St. George's Union. Mr. E. T. Hall, architect, 57, Moorgate-st., E.C.:—

		Extra for Portland Stone.
Charles Wall	£82,360	£1,400
C. Gray Hill	78,778	1,350
Henry Lovatt	76,890	1,100
B. E. Nightingale	76,785	
Shillitoe & Sons	76,625	1,000
Foster & Dicksee, Rugby*	73,949	550
Hockley & Son	71,490	2,200

LONDON.—For the erection of two detached villas, Spencer-road, Chiswick. Messrs. Palgrave & Co., architects, 28, Victoria-street, Westminster;—

Mead & Burton, Chesham* £2,600

LONDON.—For alterations, &c., at Nos. 60 and 62, St. Thomas's-street, Southwark. Mr. H. Phelps Drew, architect, 33, King-street, Covent Garden, W.C.:—

H. Gardiner	£1,012
Osborn & Sons	855
W. Norton, Chelsea*	693

LONDON.—For alterations and additions to the Armoury and adjoining premises, St. Thomas's-street, Southwark. Mr. H. Phelps Drew, architect, 33, King-street, Covent Garden, W.C. Quantities by Mr. J. Rookwood, 26, Bedford-row, W.C.:—

Snewin Bros. & Co.	£4,592	Patman & Fotheringham	£3,790
Simpson & Son	4,250	F. G. Minter	3,700
Killby & Gayford	3,995	H. J. Williams	3,693
		W. Norton, Chelsea*	3,450

LONDON.—For the erection of ten dwelling-houses on the Chadwell Heath Estate, High-road, Chadwell Heath, for Mr. S. Leheup. Mr. Fred. A. Ashton, architect, 177, Romford-road, Stratford, E.:—

A. E. Symes* £2,600

LONDON.—For the construction of roadways and sewering on a portion of the Chadwell Heath Estate, High-road, Chadwell Heath, for Mr. S. Lehlup. Mr. Fred. A. Ashton, architect and surveyor, 177, Romford-road, Stratford, E.:—

A. E. Symes* £1,240

NORWICH.—For extensions to Isolation Hospital, Norwich. Mr. Arthur E. Collins, City Architect:—

Warburton	£10,812 6 1	J. S. Smith	£11,174 5 11
Downing	11,948 0 0	J. Youngs, Norwich*	10,849 0 0
J. Hurn	11,070 0 0		
G. E. Hawes	11,500 0 0		

Heating and Ventilation.

Bailey & Co., Parsonage-buildings, Manchester ..£878

OTLEY (Yorks).—For the erection of seventeen houses, Jennett's-crescent, for the Leeds Industrial Co-operative Society, Limited. Messrs. Fairbank & Wall, architects, 3, Manor-square, Otley:—

Masonry.—Renwick & Son, Otley ..
Joinery.—J. H. Dennison, Otley ....
Plumbing.—E. Mawson, Otley ....
Plastering.—Honroyd & Sons, Bradford .....
Slating.—H. Thornton, Otley .....
Painting.—Bennett & Son, Otley ..
} £4,062 10

PARKSTONE (Dorset).—For the erection of club premises, Ashley-road, Upper Parkstone, for the Heatherlands Unionist Association. Mr. Walter Andrew, architect, Parkstone:—

T. C. Rigler	£1,150	A. & F. Wilson	£1,015
Burt & Nick	1,148	Baker & Pearcey, Parkstone*	945
W. J. Cross	1,140		
J. Hillman	1,118		

PARKSTONE (Dorset).—For alterations and additions to Ardmore, Parkstone, for Mr. James Jackson, Danecourt. Mr. Walter Andrew, architect, Parkstone:—

Alteration and Additions.

A. & F. Wilson* £293 16 10

Painting and Papering.

J. Burdett* £113 15 0

PARKSTONE (Dorset).—For alterations and additions to Prospect House, Upper Parkstone, for Messrs. Marston & Co. Mr. Walter Andrew, architect, Parkstone:—

T. C. Rigler, Poole* £142
E. F. Allen 135

ROTHERHAM.—For sinking well and driving headings for the Swinton Urban District Council. Mr. R. Fowler, C.E., Council Offices, Swinton, nr. Rotherham:—

J. Ford	£1,486	J. Fell	£719
Matthews & Co.	717	Smith, Mexborough*	678

SOUTHERNDOWN, Wales.—For rebuilding the "Dunraven Arms" hotel. Messrs. Linton & Barker, architects, Westgate Chambers, Newport:—

Wm. Moore	£5,850	Richards & Evans	£5,497
D. J. Davies	5,821	D. Davies	5,420
D. L. Jones	5,758	Phillip Gaylard, Bridgend*	5,350
C. H. Reed	5,620		

SWINDON.—For the erection of stables, &c., Lethbridge-road. Mr. W. H. Read, architect, Corn Exchange, Swindon:—

Tydeman Bros.	£1,220 10 6	F. J. Liddington	£880 0 0
C. Williams	1,025 0 0	A. J. Colborne, Swindon*	800 0 0
J. Williams	935 17 0		
J. Lay	913 12 0		

UPTON-UPON-SEVERN.—For the execution of sewerage works (1,000 yards) for the Rural District Council. Mr. E. D. Marten, C.E., Codsall, Wolverhampton. Quantities by Engineer:—

T. W. McCann	£545 10	J. Talbot, Quest Hills, Malvern	£490 0
Thos. Vale	538 16		

WINSLOW (Bucks).—For sundry sanitary alterations at Winslow Hall, Bucks. Mr. H. Phelps Drew, architect, 33, King-street, Covent Garden, W.C.:—

Matthews Bros.* £153

[Lowest of two tenders received.]

WOLVERTON.—For new additions to envelope works, for Messrs. McCorquodale & Co., Limited. Mr. H. Phelps Drew, architect, 33, King-street, Covent Garden, W.C.:—

Honour & Son	£2,049	T. P. Robinson, Wolverton*	£1,755
H. Martin	1,881		

LONDON SCHOOL BOARD TENDERS.

AT the last meeting of the London School Board, the Works Committee submitted the following lists of tenders. Mr. T. J. Bailey is the Board's Architect:—

CRAMPTON-STREET.—Re-arranging and refitting offices, all departments; alterations to urinals; new sparge pipes; refitting teachers' offices on ground and second floors; removing babies' offices and boys' teachers' water-closets, and soil pipe on the ground floor mezzanine; and providing a new drainage scheme:—

Lawrance & Sons	£3,845 0 0	W. Downs	£2,920 0 0
Munday & Sons	3,720 0 0	J. & C. Bowyer	2,842 0 0
Stimpson & Co.	3,400 0 0	Johnson & Co.	2,756 0 0
W. Hammond	3,047 0 0	Killingback & Co.	2,736 7 7
Martin, Wells, & Co.	3,022 0 0	Akers & Co.	2,661 0 0
Lathey Bros.	2,997 0 0	Edwards & Medway*	2,368 0 0
Whitehead & Co., Ltd.	2,975 0 0		

DIVISIONAL OFFICE SITE (BLACKHEATH-ROAD).—Room for science instructor, metal-work room, manual training centre for forty boys, cookery centre, laundry centre, with a playground on the roof for the girls; and enclosing, draining, and tar-paving the additional land:—

Bulled & Co.	£5,486	J. & C. Bowyer	£4,929
Garrett & Son	5,280	Johnson & Co., Ltd.	4,832
Edwards & Medway.	5,141	Smith & Son, Ltd.	4,805
Kirk & Randall	5,100	E. Triggs	4,800
F. & H. F. Higgs	5,067	J. Marsland*	4,683
White & Co.	5,047		

HOLDEN-STREET.—Improvements—Providing halls for all departments; new staircases for boys and girls; drawing class-room; new cloak-rooms and lavatories for all departments; re-arranging stepping in centre class-rooms; improving lighting of class-rooms for all departments; providing one additional 40 class-room on each floor; removing and re-building a portion of existing infants' water-closets, and providing new covered playgrounds for boys, girls, and infants; providing heating chamber in basement:—

Holloway Bros.	£13,895	B. E. Nightingale	£12,875
Lawrance & Sons	13,552	Stimpson & Co.	12,645
Spencer, Santo, & Co., Ltd.	13,137	Edwards & Medway	12,500
Longley & Co.	13,075	Kirk & Randall	12,228
Lathey Bros.	12,889	Johnson & Co., Ltd.*	11,930

NECKINGER-ROAD.—Enlargement, infants' department, 100, with additional cloak-room and lavatories:—

Bulled & Co.	£1,938	White & Co.	£1,525
Wagstaff & Sons	1,676	J. Marsland	1,496
Stimpson & Co.	1,674	J. Appleby*	1,438
J. & C. Bowyer	1,593		

Supply of desks for use in centres for the deaf, on a running contract:—

Contractors.	No. 0 size.	No. 1 size.	No. 2 size.	No. 3 size.	No. 4 size.	No. 5 size.	No. 6 size.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
J. H. W. Martin ..... each	4 0 0	4 0 0	4 0 0	4 0 0	4 0 0	4 0 0	4 0 0
J. Garvie & Sons ..... ,,	2 5 0	2 5 0	2 5 0	2 5 0	2 5 0	2 5 0	2 5 0
T. Cruwys ..... ,,	1 15 0	1 15 0	1 14 6	1 14 0	1 13 6	1 13 6	1 13 6
London School Furniture Company ..... ,,	1 7 6	1 7 6	1 7 6	1 7 6	1 7 6	1 7 6	1 7 6
H. Bouneau ..... ,,	1 7 0	1 7 0	1 6 9	1 6 9	1 6 6	1 6 6	1 6 6
G. M. Hammer & Company, Limited* ..... ,,	1 4 6	1 4 6	1 4 6	1 4 6	1 3 6	1 3 6	1 3 6

See also next page.

Cleaning and Painting.

The interior work at the following schools will be carried out between December 16, 1899, and January 6, 1900; and the exterior work between April 7 and May 5, 1900.

ADDINGTON-STREET.—Cleaning interior :—

J. Appleby	£284 0 0	G. Brittain	£122 0 0
W. V. Goad	187 0 0	Holloway Bros.	122 0 0
W. Hammond	156 0 0	Bristow & Eatwell	115 2 10
Maxwell Bros., Limited	154 0 0	Rice & Son	115 0 0
J. F. Ford	147 0 0	B. E. Nightingale*	97 0 0
H. & G. Mallett	129 0 0		

ALMA SCHOOL.—Cleaning interior :—

Johnson & Co.	£210 10	Holliday & Greenwood	£179 0
Bulled & Co.	196 0	H. J. Williams*	148 0
White & Co.	187 0		

BETTS-STREET.—Cleaning interior :—

A. W. Derby	£242 10	G. Barker	£154 0
Wall & Co.	186 0	J. Haydon*	152 9
Gibb & Co.	182 0	J. Kybett	145 0
J. F. Holliday	160 0		

BLUNDELL-STREET.—Cleaning interior :—

Gardner & Hazell	£476 10	Densham & Sons	£335 0
Williams & Son	421 0	G. Foxley	289 19
T. Cruwys	374 0	Marchant & Hirst*	279 0
Stevens Bros.	338 0		

"BRECKNOCK" SCHOOL.—Cleaning interior of special school :—

F. Britton	£199 19	W. Brown	£75 17
Wall & Co.	135 0	W. Hornett	63 0
T. Cruwys	109 0	C. & W. Hunnings*	55 0
Gardner & Hazell	79 10		

BYRON-STREET.—Cleaning interior :—

Gibb & Co.	£249 0 0	J. T. Robey	£217 0 0
J. Haydon	238 14 0	J. F. Holliday	205 10 0
A. W. Derby	230 0 0	S. H. Corfield*	175 0 0

FAIRFIELD-ROAD.—Cleaning interior :—

A. W. Derby	£177	J. F. Holliday	£123
A. E. Symes	168	J. T. Robey*	112
Gibb & Co.	147		

GLYN-ROAD.—Cleaning interior :—

McCormick & Sons	£298 0	G. Barker	£185 0
Silk & Son	248 0	J. Kybett	185 0
Collis Willmott	218 0	G. Wales*	163 7
T. Cruwys	194 0	S. H. Corfield	153 0
B. E. Nightingale	190 0		

HOLMES-ROAD.—Cleaning interior :—

T. Cruwys	£452 0 0	G. Foxley	£326 16 8
Stevens Bros.	398 0 0	W. Brown	283 0 0
Densham & Sons	390 0 0	Wall & Co.	249 0 0
McCormick & Sons	386 0 0	Marchant & Hirst	237 0 0
W. Hornett	347 0 0	T. Nicholson*	215 0 0

LATCHMERE SCHOOL.—Cleaning interior of boys', girls' and infants' schools, and painting exterior of junior mixed school :—

Spencer, Santo, & Co., Limited	£574	H. & G. Mallett	£280
Akers & Co.	394	Bulled & Co.	266
Gregory & Co.	347	Somerford & Son	262
Maxwell Bros., Limited	305	Garrett & Son	255
O. Craske	288	E. Flood	254
		Rice & Son*	244

LAURISTON-ROAD.—Cleaning interior :—

Barrett & Power	£335 0	Snewin Bros. & Co.	£138 9
Silk & Son	226 10	J. Haydon	138 0
Grover & Son	196 0	J. Kybett	135 0
Collis Willmott	168 0	G. Wales*	134 9

"MOBERLY" SCHOOL.—Cleaning interior of boys" girls', and infants' schools, and painting interior and exterior of special school :—

H. C. Clifton	£595 0 0	F. Chidley	£235 0 0
Marchant & Hirst	299 0 0	Bristow & Eatwell	234 1 6
Densham & Sons	296 0 0	W. Chappell	230 0 0
W. R. & A. Hide	293 10 0	F. T. Chinchen*	224 10 0

MONTEITH-ROAD.—Cleaning interior :—

Gibb & Co.	£365 0	J. T. Robey	£305 0
Silk & Son	362 10	J. Kybett	264 0
G. Wales	315 9	S. H. Corfield*	250 0
J. F. Holliday	312 0		

MORNING-LANE.—Cleaning interior :—

Barrett & Power	£430 0	J. Haydon	£242 0
McCormick & Sons	371 0	G. Barker	231 0
Gardner & Hazell	330 0	Snewin Bros. & Co.	224 6
Silk & Son	330 0	G. Wales	214 0
Collis Willmott	260 0	J. Kybett*	196 0
Grover & Son	256 0		

NYNEHEAD-STREET.—Cleaning interior :—

C. Foreman	£174 10 0	Hayter & Son	£127 10 0
Martin, Wells, & Co.	152 0 0	Jones & Groves	125 0 0
J. & C. Bowyer	141 15 0	H. J. Williams	118 0 0
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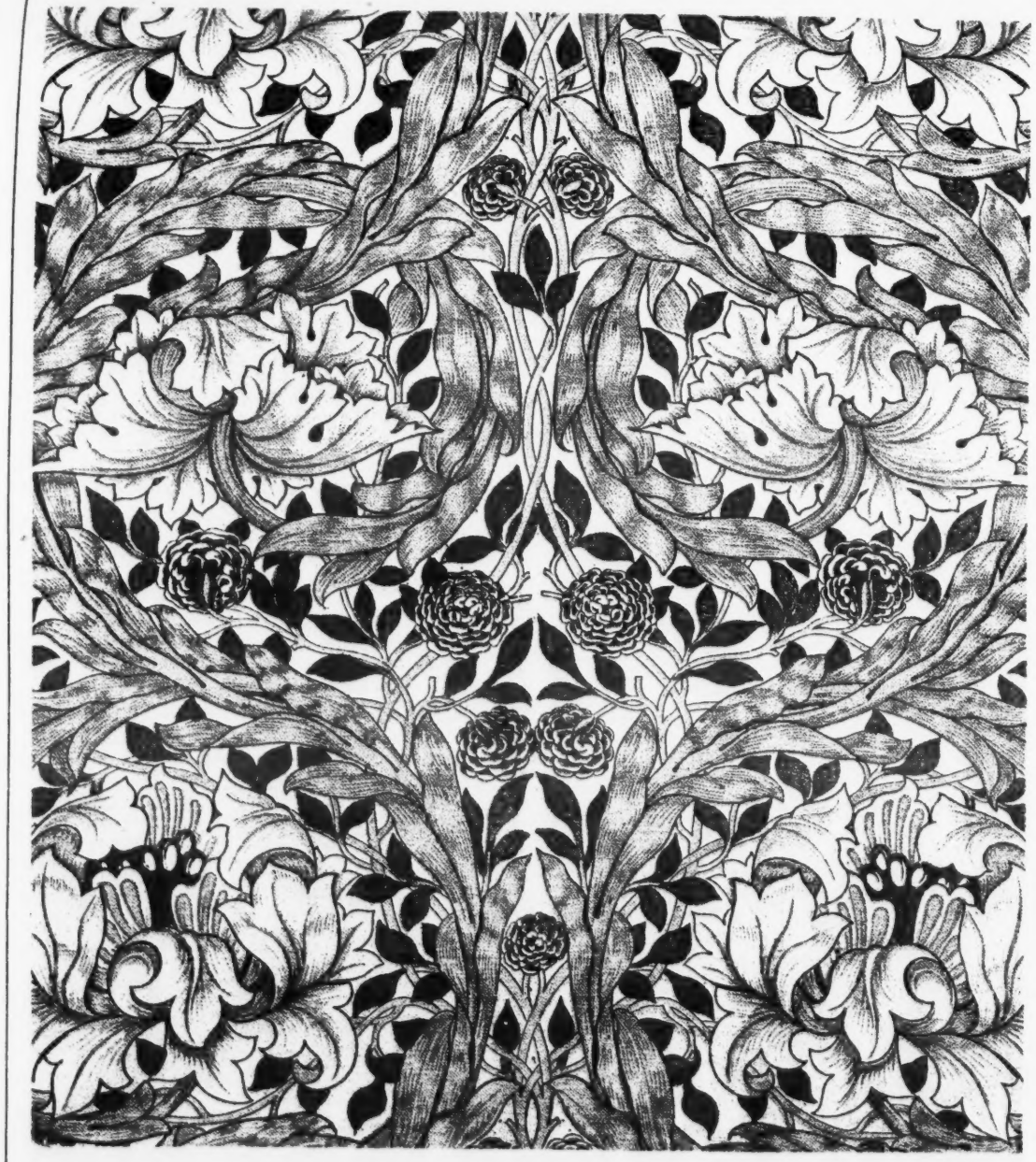

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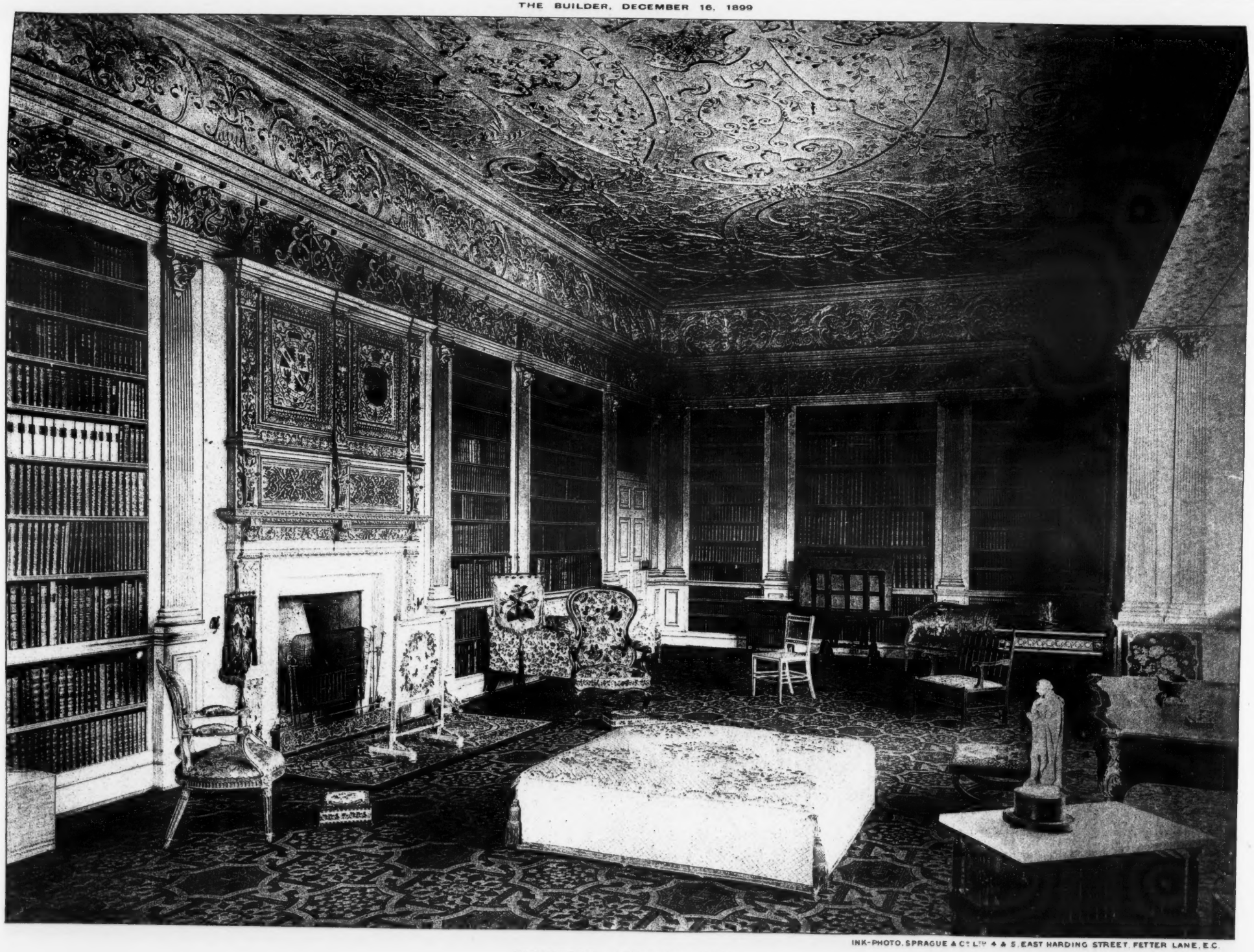

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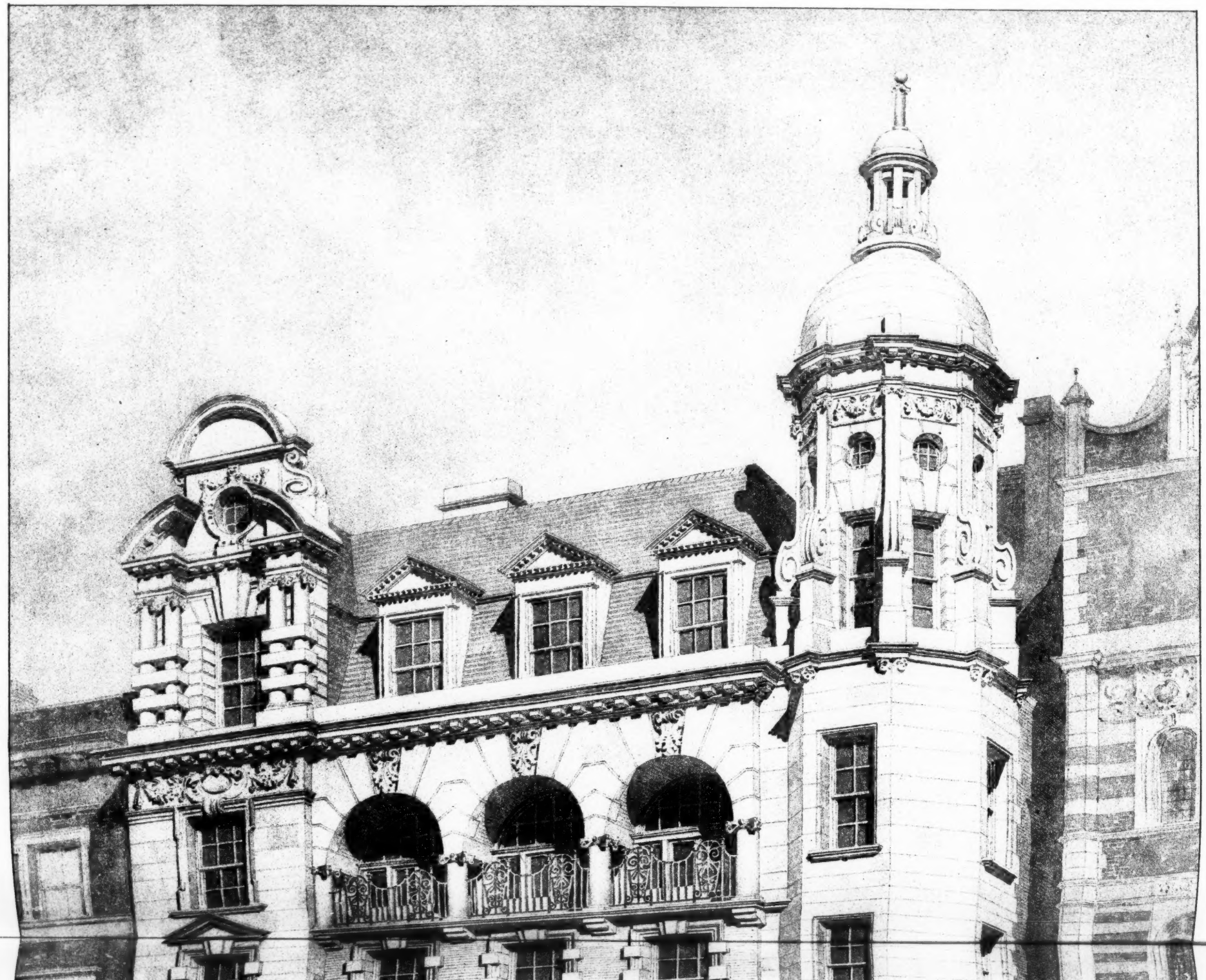

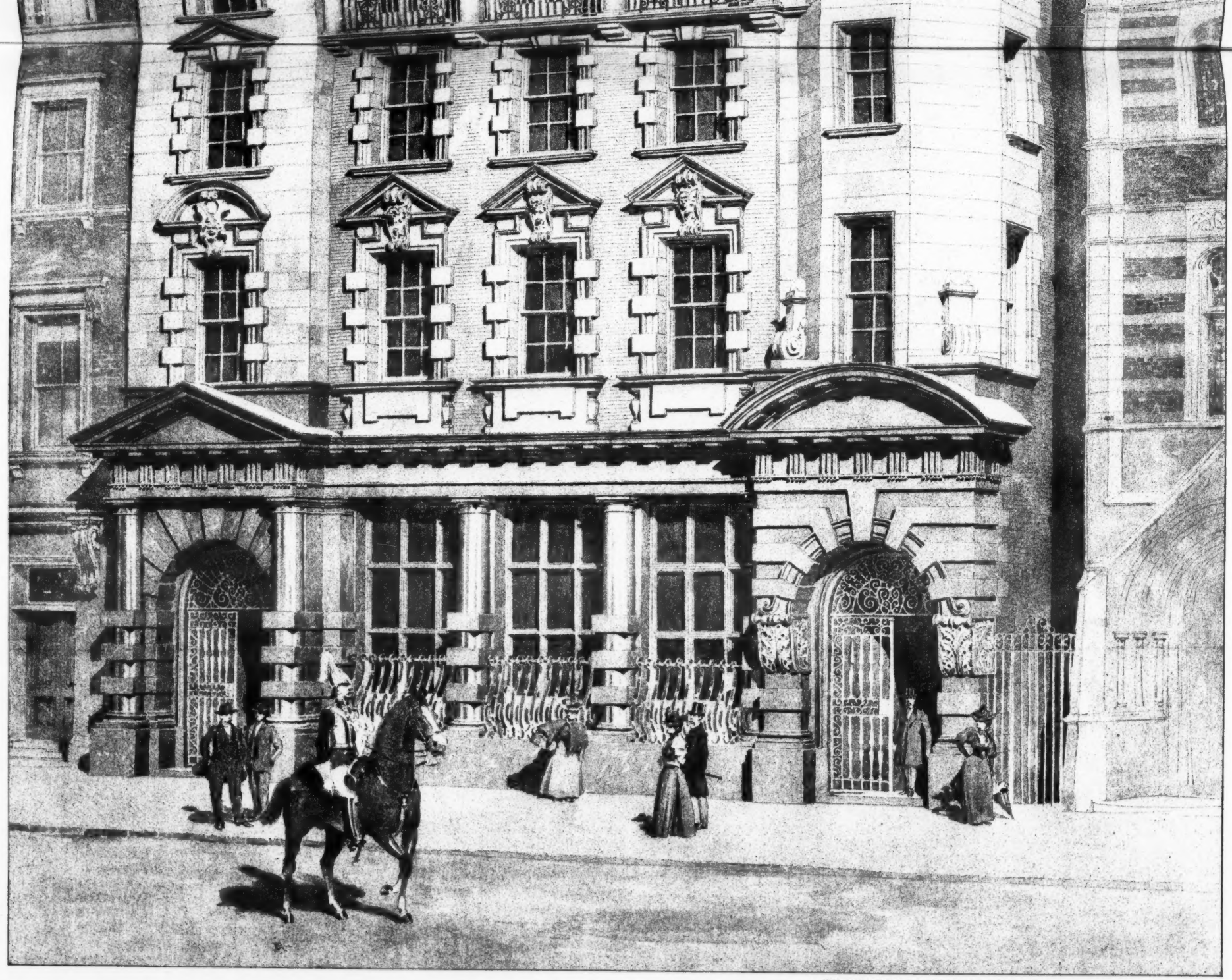

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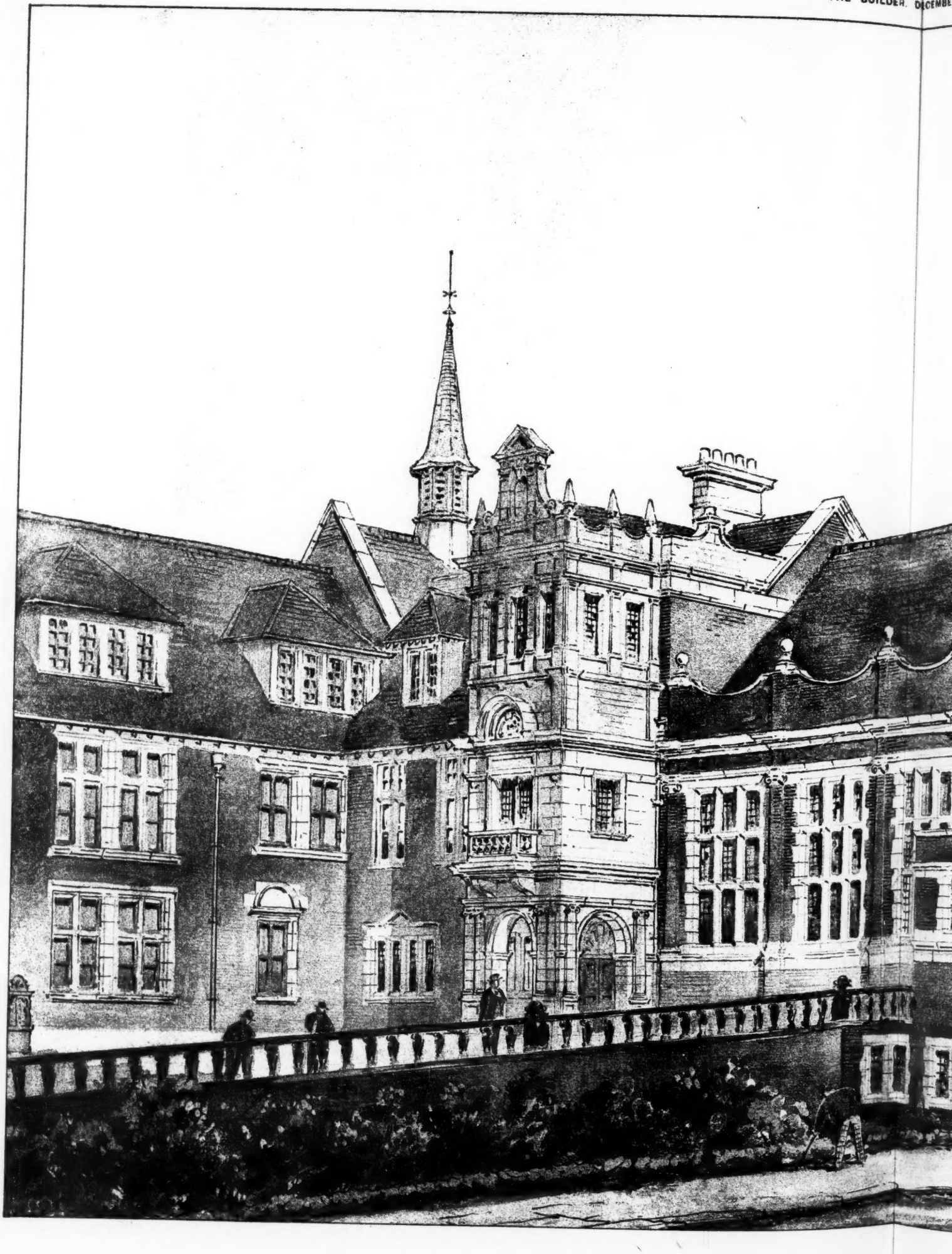

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